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Modification of fixation disparity by visual-feedback

Ivan D. Hyde
Pacific University

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Abstract

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APPROVED

Thesis Committee

H M Haynes
Chairman
Harold M. Haynes

Niles Roth
Niles Roth

Clifton M. Schor
Clifton M. Schor

Joy Hirsch
Joy Hirsch

Graduate Committee

Director of Graduate Studies
David R. Malcolm

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This experiment was designed to study the extent to which precise binocular fixations as measured by lateral fixation disparity could be trained by means of visual feedback. Twenty subjects were trained to minimize their own fixation disparity responses by introducing an intermittent binocular stimulus into the display field which reduced fixation disparity to within 2' of arc. Introduction of the intermittent control stimulus was paired with an immediate visual feedback to the subject. This allowed the subject to be aware immediately of his own vergence responses. Transference of the practice effect was studied by: (1) plotting individual and group learning curves where frequency of the intermittent control stimulus was plotted as a function of time (training sessions), (2) change in the average magnitude of fixation disparity measured at 4.25 m, 40 cm and 20 cm, (3) graphical comparison of the patterns of lateral fixation disparity (Ogle, et al, 1970) resulting from induced lateral prism and lenses at 4.25 m and 40 cm. Training of subjects to meet specific criteria varied from two to four weeks. Persistence of the practice effects was tested one and six weeks after the completion of training. Significant differences (α=.05) were found in the average magnitudes of fixation disparity at the three test distances and in the patterns of lateral fixation disparity.

CHAPTER I

INTRODUCTION

Fixation disparity tests measure the difference or discrepancy between the vergence stimulus and the vergence response. These differences are measured as lateral, vertical or cyclorotational, but this study is limited to the lateral components. The vergence stimulus and vergence response are most often calibrated in meter angles or prism diopters. The discrepancy or difference between the two is most often calibrated in minutes of arc or prism diopters.

Behaviorally, lateral fixation disparity may be described as a "motor response lag" of the vergence system, similar to the accomodative lag. Psychophysical techniques are as yet the best clinical procedure for quantifying these responses with sensitivity reaching the vernier acuity thresholds for lines (approx. 4" of arc).

Fixation disparity responses may be described as symmetrical (bilateral fixation error) or asymmetrical (unilateral fixation error). These differences are inferred from the phenomenal description of a subject and supported by eye movement recordings. For the majority of people, the direction of the fixation disparity is the same as that of the heterophoria at the same test distance. The magnitude of the fixation disparity for a given individual can not be predicted by the magnitude of the phoria. The converse is true also.

In order to measure fixation disparity specific testing conditions are required. These may be summarized as follows:

1) A luminous binocular display which provides the stimulus for normal sensory fusion or unification to occur.
2) Binocular fixation of the fusable elements in the display field is necessary.
3) Test objects displayed only to the right and only to the left eyes, are required. These test objects should not be "attached" to binocularly fusable objects. They need to be "free" to move. Vernier displacement of these monocularly displayed test objects is used to measure fixation disparity for the particular testing situation.

There is little or no doubt that fixation disparity testing conditions measure the discrepancy between the binocular vergence of the optical stimulus (direction of the light) and the vergence of the eyes. Binocular projection theory (correspondence model) adequately accounts for the perceived direction of the monocularly displayed test targets. No exceptions are known or have been reported in the literature reviewed. The theoretical, physiological and clinical significance of fixation disparity responses is open to many interpretations.

To introduce the complexity of analyzing the theoretical and clinical significance of fixation disparity measurements Professor Haynes has summarized nine generic categories of potential hypothesis sets. These sets which follow are not stated in a form ready for given study or experiment. Rather, they suggest the class of assumptions and hypotheses which may be formulated according to the needs of a given problem or study. They also suggest different possible ways by which abnormal magnitudes of fixation disparity may have evolved or be subject to clinical control or modification.

"1. Improved Proximal Stimulus Hypothesis: Reduction of abnormal magnitudes of fixation disparity (vertical and/or lateral) by lenses, prisms and/or training is clinically desirable to improve the input conditions at the retinal level for enhancement of binocular visual discriminations including stereoacuity, stereolocalization, organization of stereo-field, etc. (Lenses are used for optical transformation of proximal stimulus conditions to more optimal conditions.)

2. Unidirectional Stress Hypothesis: Fixation disparity may result from abnormal vergence behaviors which are not associated with accommodative behavior. To explain the vergence malfunction(s) a unidirectional stress hypothesis is postulated. Neurological stress hypotheses assume abnormal innervations or tonic overactions or underactions of a particular extraocular muscle set. In addition, stress hypotheses may be formulated relative to orbital mechanics (differential resistance to movement of the two eyes, adhesions, insertions, check ligaments, etc.). Similar terms such as muscle imbalance, binocular stress and latent stress are included. "Stress" used in this manner is an intervening variable. Theoretically, an intervening variable is postulated to order or explain the covariance of other vergence dysfunctions seen clinically such as heterophorias, reduced ductions, reduced prism vergence response times, periodic strabismus and various nonconcomitant motor conditions. "Stress" is not a necessary

hypothesis! Abnormal fixation behavior does not prove the "existence" of stress (circular reasoning). Stress is but one possible hypothesis.

3. Accommodative Hypothesis: Abnormal fixation disparity may result from adverse interactions between accommodation and convergence. (Interactions may be neutral, facilitory or disruptive.) By suitable testing, it may be determined in a given case whether abnormal lateral fixation disparity results from (1) hypo or hyper posturing of accommodation or (2) from normal accommodative responses with insufficient or overreactive interaction or some combination of dysfunctions.

   Unstable fixation disparity may be reduced with either abnormal exo or eso fixation disparity when excessive variability in accommodation responses are demonstrable and when interaction between accommodation and convergence is greater than zero. Clinically, if variability is reduced or controlled with 14B cross cylinder sphere, low neutral dynamic retinoscopy, etc., the accommodative source is confirmed. Instability may be confined to the vergence system without accommodative involvement.

4. Suppression Hypothesis: Abnormal fixation disparity may result from central suppression (alternate or unilateral). It is postulated that a circumscribed suppression zone prevents normal vergence error signals from being monitored from the bifoveal region. Therefore, eye posture may be found at the edge of the suppression zone.

5. Inadequate Stimulus-Response Hypothesis: Fixation disparity results from failure of the vergence systems to respond to the essential stimulus elements in the distal and/or the proximal stimulus. Training would be the theoretical choice for modification of fixation disparity if this were the correct hypothesis in a given case. Special consideration must be given to using three dimensional objects rather than bidimensional displays for testing.

6. Adaptation Hypothesis: Varying amounts of lenses and prisms are prescribed for short periods of time to induce excessive fixation disparity. The resulting adaptation may result in training more precise fixation skills. The increased plasticity to respond to lenses and prisms can be

measured by the change in the slope of the fixation disparity to forced vergence with prisms and spheres.

7. Cumulative Response History Hypothesis: Abnormal (or normal) fixation behaviors may result from the cumulative vergence response history of the individual. Fixation disparity, at any given time, may be described as the cumulative resultant of differential reinforcement contingent upon the individual person's unique optical, motor, cultural and general physiologic history.

8. Coordination or Skilled Movement Hypothesis: Abnormal fixation disparity in magnitude and/or slope is regarded as an unskilled movement under binocular viewing conditions. Clinical deviations represent the population variances in this postural skill. Measurement of fixation disparity is viewed as one of many clinical indicators used to scale convergence, vertical and lateral vergence fixations and tracking skills.

9. Error Detection Hypotheses: Normal amounts of fixation disparity are used as a sensory control signal for monitoring binocular eye position during normal behavior. Abnormal fixation disparities indicates a malfunction in this servo-model control system. Stimulus conditions for the detection of movement proximal or distal by a target or by the organism is present at the retinal level. Stimulus information for movement detection is present by the increase or reduction in fixation disparity before a vergence response is initiated. The change in fixation disparity prior to a vergence response becomes the potential error signal to inform the organism of the appropriate direction to change the vergence response. A return to the original level of fixation disparity following a vergence response may be the signal for steady binocular fixation and constant input conditions."

This study was designed to study selected aspects of items 5, 6, 7 and 8 as formulated in the statement of the problem. It was not designed to investigate all the possible approaches suggested by Haynes.

DEFINITION OF TERMS

Accommodation. The dynamic dioptric changes produced by the crystaline lens in the human eye in response to both internal and external variables. Accommodation is measured in diopters in either stimulus or response units.

Accommodative convergence. Convergence changes associated with changes in accommodation, usually clinically measured by changes in phorias under dissociation of binocular fixation.

Accommodative lag. This term is used to describe the dioptic difference between the accommodative posture and the fixation plane when the habitual refractive correction is used as the lens control

Accommodative posture. This performance model definition describes the level of accommodative activity measured in dioptres from the fixation plane in either stimulus or response terms.

Convergence. This term refers to lateral, inward movements of the eyes from parallelism leading to binocular fixation. Measurements can be made under binocular or dissociated (phoric) conditions.

Divergence. Binocularly, a deviation or a relative movement of the lines of sight of the two eyes outward, so that the lines of sight intersect at a greater distance in front of the eyes or a lesser distance behind.

Esodisparity. Fixation disparity in which the lines of sight are converged in front of the fixation plane or the binocular vergence of the light stimulus

<u>Exodisparity</u>. Fixation disparity in which the lines of sight are converged behind the fixation plane or the binocular vergence of the light stimulus.

<u>Motor Response Lag of Accommodation or Convergence</u>. This is measured by the difference between the response in diopters or meter angles and the stimulus level in diopters or meter angles.

<u>Prism</u>. A transparent body bounded in part by two plane faces which are not parallel and which cause a deviation in the path of light.

1. <u>Base-In Prism</u>. An opthalmic prism placed before the eye with its base-apex line horizontal and its base nasalward.

2. <u>Base-Out Prism</u>. An opthalmic prism placed before the eye with its base-apex line horizontal and its base nasalward.

<u>Psychophysics</u>. The branch of science that deals with the interrelationships of physical stimuli and their "mental" or behavioral correlates.

<u>Visual Feedback</u>. A general term used to describe various sensory, motor or optical processes by which the organism monitors its own visual reactions at any given point in time.

CHAPTER II

STATEMENT OF THE PROBLEM

This study was designed to investigate:

(1) the extent to which precise binocular fixation as measured by lateral fixation disparity could be trained by visual-feedback where no other forms of visual training were given concurrently.

(2) whether a consistent practice effect under training conditions would transfer to other testing distances.

(3) whether changes could be brought about by means of visual-feedback training on the slopes and types of fixation disparity responses as described by Ogle, et al (Type I, II, III, and IV curves).

SIGNIFICANCE OF THE STUDY

Correction of fixation disparity has been in the form of lenses and prisms. Many methods currently in use do not correct the fixation disparity, but optically compensate for its presence. Prescription of lenses and/or prisms alters the vergence response so that the measured disparity is or approaches zero. When reduced to zero this measurement has been termed the associated phoria. Changes in the magnitude of fixation disparity resulting from many forms of visual training are recognized among clinicians (Haynes, H.M.H., 1977). Monocular vertical and horizontal control lines widely used for suppression control in vectograph and stereoscope targets change their seen positions as training progresses. The perceived changes are usually noted as being toward the "normal". The Brock Posture Board and the Keystone AN series are the nearest examples of procedures that may be directly related to fixation disparity. No controlled studies had been reported on the effects of visual training on the magnitude of fixation disparity and the curves of fixation disparity due to induced prisms and lenses. Visual feedback training appeared to provide such possibilities.

One task of Optometry is to improve the function of the visual system. The possibility of developing a new clinical tool for directly modifying the vergence response of patients by training them to respond to the essential stimulus elements, is of value. It is hoped that this study will contribute to the knowledge on fixation disparity and thereby aid in a better understanding of this phenomenon.

CHAPTER III

REVIEW OF THE LITERATURE

A search of the literature revealed no published studies where fixation disparity was trained using visual feedback procedures.

Haynes and Gray (1961) using visual feedback, trained four subjects to reduce their fixation disparity under a specific training condition. Subjects were presented with a fixation disparity target (Fig. 1). Training was commenced when the superior monocular element, the V, was reported seen outside the boundaries of the interval created by the inferior monocular lines. Subjects were instructed to try and keep the V within the lines. An intermittent binocular light stimulus was introduced to bring the V within the boundaries of the lines when required. Reduction in fixation disparity was measured as a decrease in the number of times the binocular light stimulus was needed to align the monocular elements. Due to the nature of the target used to measure the angular magnitude of fixation disparity it appeared difficult to express precise changes in magnitude. Practice effects were demonstrated on the four subjects by changes in fixation disparity curves to forced prism vergence.

Ogle, Mussey and Prangen (1949), Ogle and Prangen (1951), Ogle et al (1967), investigated the phenomenon of fixation disparity 2.5 meters and 29 cm from the subjects.

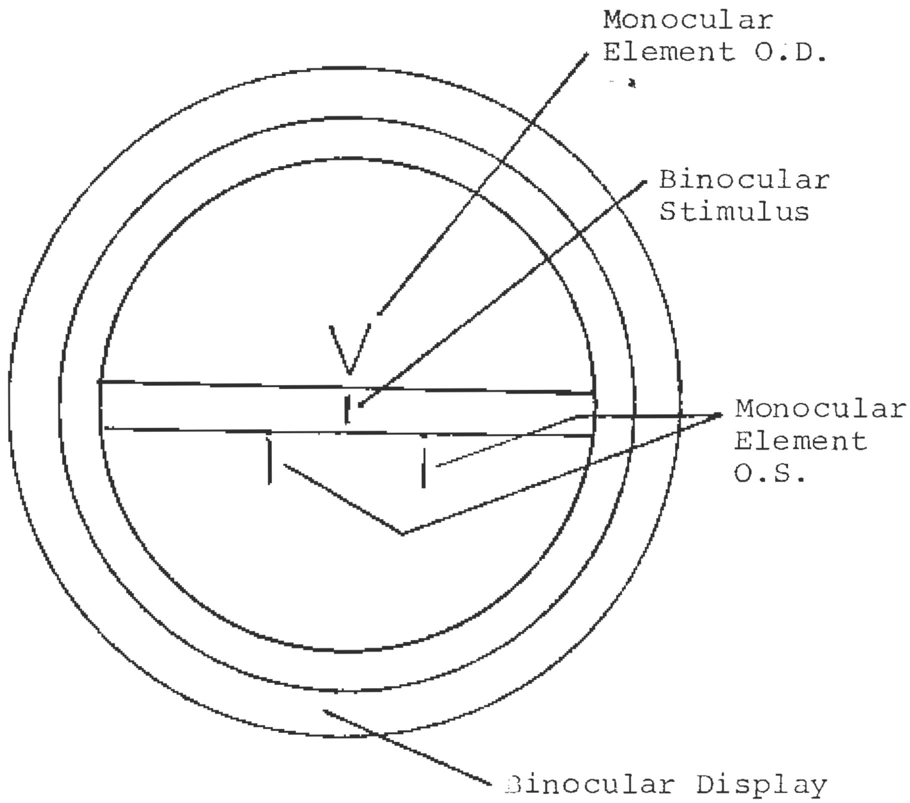


Figure 1. Schematic of target used by Haynes and Gray to train subjects to reduce their fixation disparity.

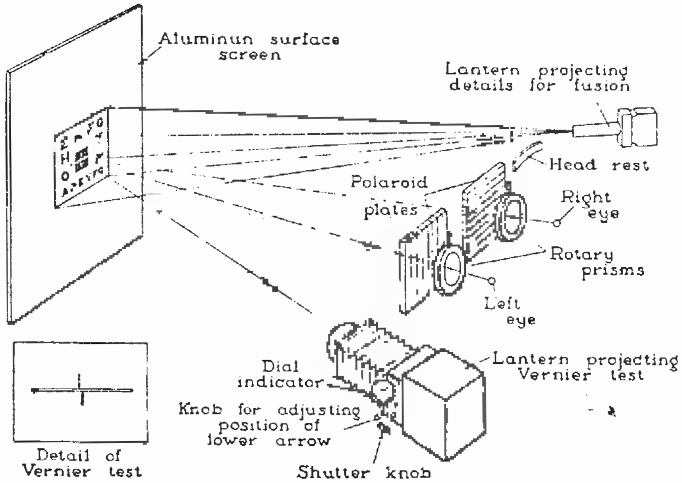


Figure 2. Perspective drawing of the instrument used to measure fixation disparity for distant vision. Ogle, K.N., Mussey, F., and Prangen, A. de H.: Fixation disparity and the fusional processes in binocular single vision, Am. J. Ophth., 32:1069-1087, 1949. (From Oculomotor Imbalance in Binocular Vision and Fixation Disparity. Lea and Febiger, 1967.)

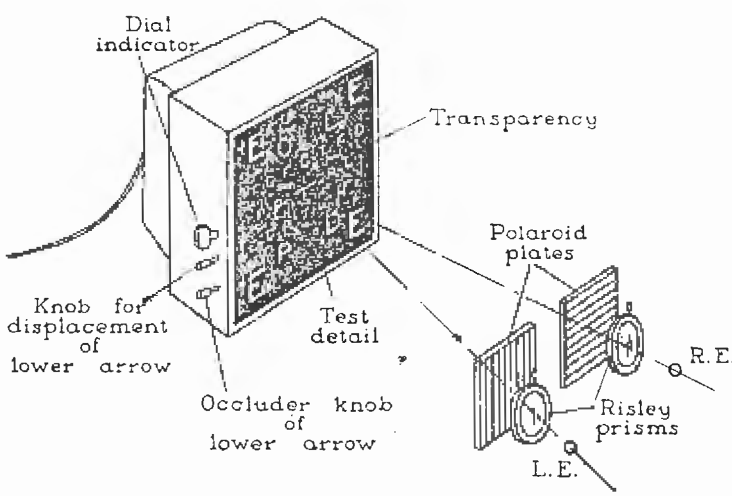


Figure 3. Perspective drawing of the instrument used to measure fixation disparity for an observation distance of 33 cm. Ogle, K.N., Mussey, F., and Prangen, A. de H.: Fixation disparity and the fusional processes in binocular single vision, Am. J. Ophth., 32:1069-1087, 1949. (From Oculomotor Imbalance in Binocular Vision and Fixation Disparity, Lea and Febiger, 1967.)

The distance target for fusion stimuli subtended 20 degrees (Fig. 2). A small central area of a given size could be blanked out at the center of the target and thus appear black to the subject. The size found convenient was 1.5 degrees. Within this center no stimuli for fusion were present except a horizontal bright line 28 cm long and 5 mm wide. A pair of vernier like arrows were seen, above and below side of the horizontal line. The upper arrow was stationary, but the lower one could be displaced horizontally. The displacement of the two arrows was read by the experimenter from an accurate dial indicator to an estimated 0.2 minutes of arc. By means of a shutter arrangement the lower arrow could be occluded or flashed onto the screen at the will of the operator. The long horizontal line was used to prevent vertical and cyclo disparities and fusion of the arrows. General illumination was subdued. The subject was required to align the lower arrow with the top one. The lower arrow was not presented continuously but was flashed. The method of limits was used for alignment. Fixation disparity was determined for different values of prism power introduced before the patient's eyes. Prism was placed alternately base-out and base-in, the base-out in four prism steps, the base-in in two prism steps.

The technique of exposing the arrow had no significant effect on the curve obtained. They found that when both eyes were blurred with plus lenses, the fixation disparity curve did not change appreciably. When only one eye was blurred, however, the disparity did change with prism vergence. (Peripheral "fusion" was varied by using a sequence of squares which increased in angular subtence. Fixation disparity to forced lateral prism vergence increased with increasing angular size of the target.)

The effect of lenses (+1.00, -1.00) added binocularly was also investigated. Fixation disparity changed in the divergent direction with plus spheres and in the convergent direction with minus spheres.

The near test necessitated a different instrument (Fig. 3). Curves were plotted for both prisms and lenses. They found that in general the prism vergence curves were displaced laterally by spherical lenses, as though the lenses merely added a constant equivalent vergence change. The magnitude of this equivalence was found to be about 0.6 MA (3.5 to 4 prism diopters) to one diopter of lens power. In the early experiments only the Type I and II curves were distinguishable. The third and fourth groups became evident with further investigation.

Type 1 curve (Fig. 4) is the most commonly found curve - the sigmoid curve. The distinguishing feature is that, for both base-in and base-out prisms, as the prism power is increased and the prism vergence limit is approached the measured fixation disparity suddenly becomes large and then is followed immediately by the patient's experiencing a rather dramatic diplopia. Considerable variation in the exact shape

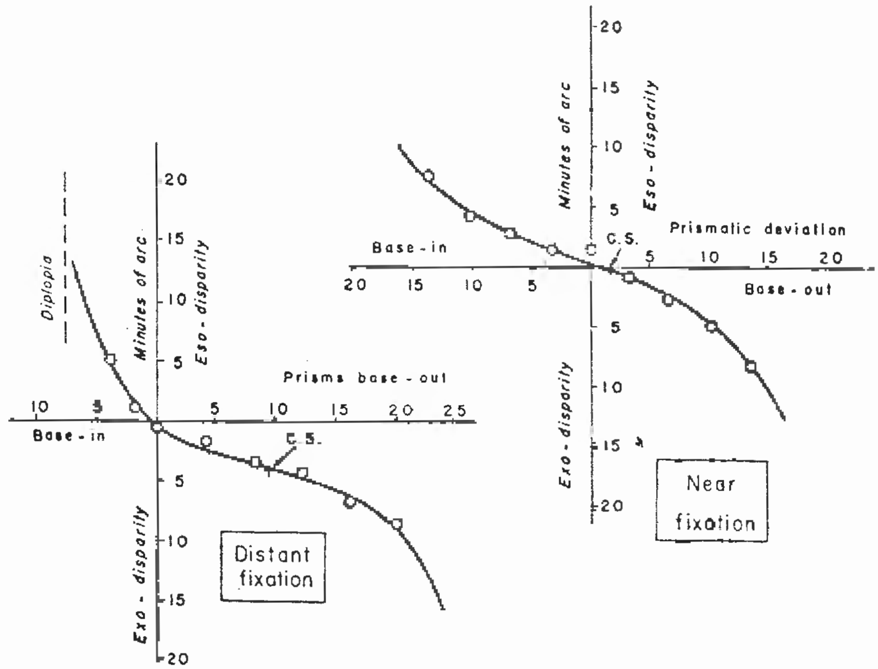


Figure 4. Typical examples of fixation disparity-prism curves of type I. (Oculomotor Imbalance in Binocular Vision and Fixation Disparity. Lea and Febiger 1967).

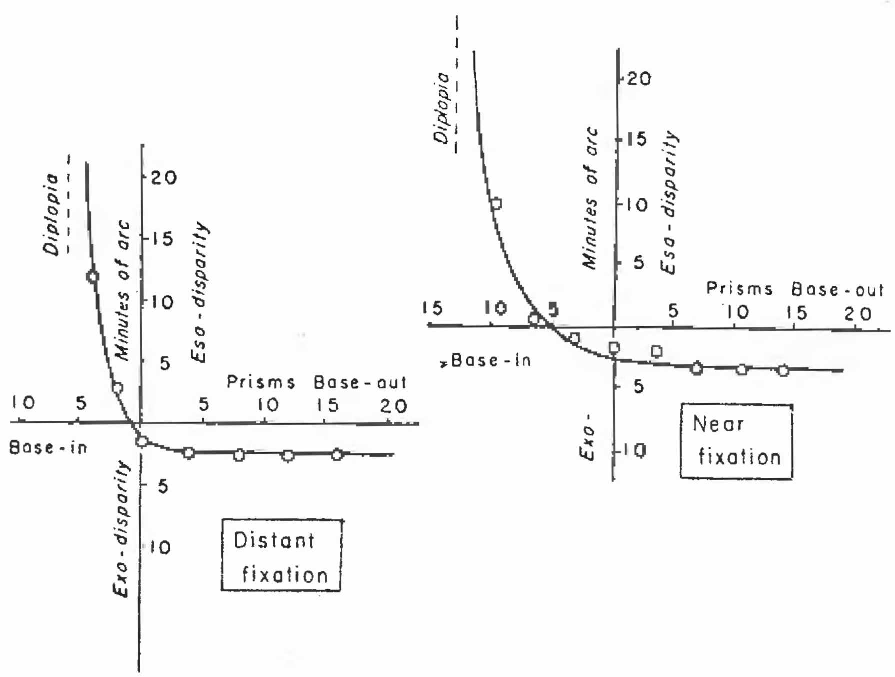


Figure 5. An example of the type of fixation disparity curve designated as type II. In this example the curves cross the abscissa, so that the associated phoria can be estimated. The asymptotic disparity with increasing power of prisms base-out is exophoric. (Oculomotor Imbalance in Binocular Vision and Fixation Disparity. Lea and Febiger 1967).

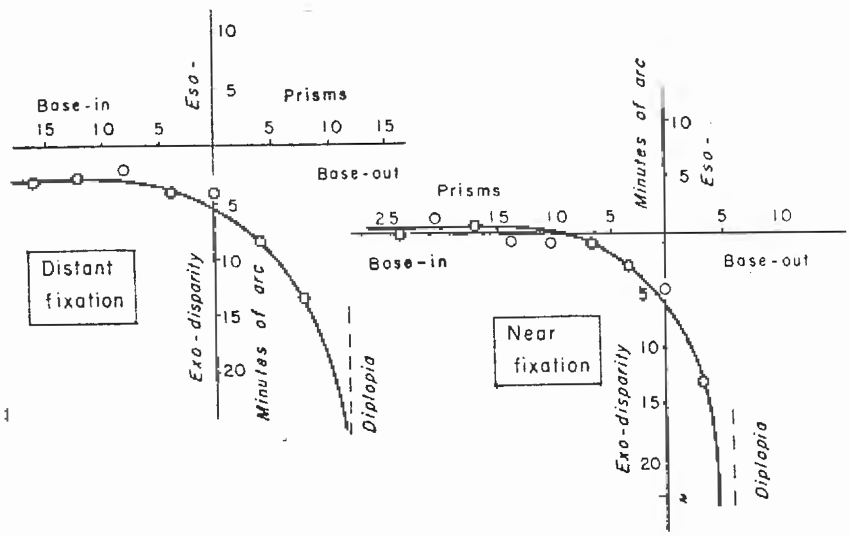


Figure 6. An example of the type of fixation disparity curve designated as type III. The disparity for increasing powers of prisms base-in approaches an asymptote that remains esophoric. The associated phorias can be estimated because the curves cross the abscissa. (Oculomotor Imbalance in Binocular Vision and Fixation Disparity. Lea and Febiger 1967).

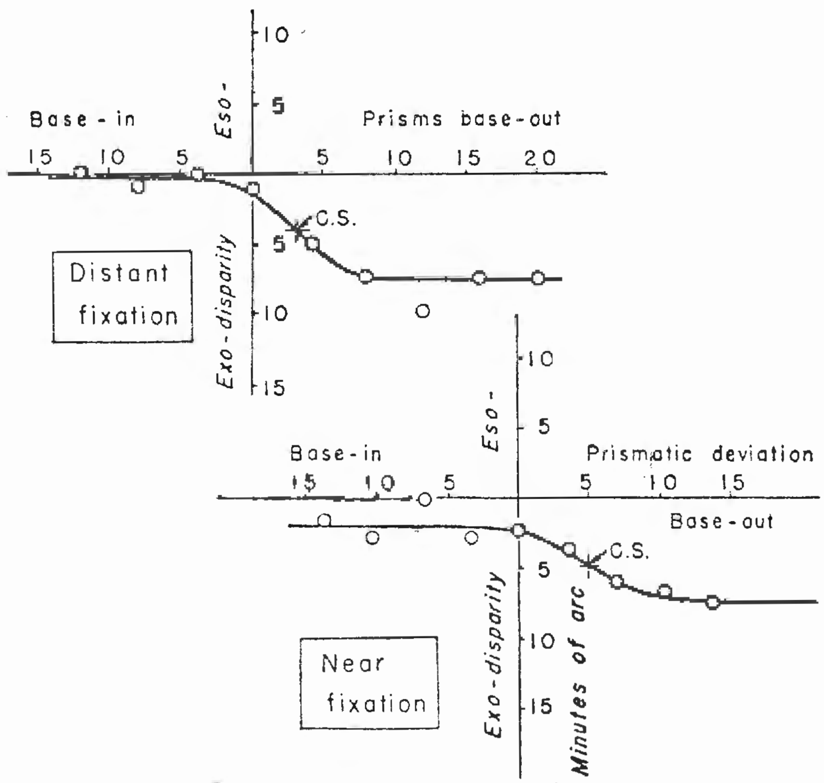


Figure 7. An example of the pattern of fixation disparity-prism measurements designated as a type IV curve. An asymptotic disparity occurs for increasing prismatic deviation with both prisms base-out and base-in. In this example the curves do not cross the abscissa, so the associated phoria cannot be estimated. (From Oculomotor Imbalance in Binocular Vision and Fixation Disparity. Lea and Febiger, 1967).

of the curves is found. The variations are principally (1) in the slope of the central portion of the curve, (2) in the displacement with respect to the coordinate axes of the graph and (3) in the range of the prism vergence limits.

Type II curve (Fig. 5) - the lower portion of the sigmoid curve is missing. When the eyes are forced to converge by the insertion of prisms base-out before the eyes, the fixation disparity asymptotically approaches a lower limit of exo-disparity. As the prismatic deviation is increased the disparity tends to remain constant, until blurring of vision occurs and diplopia follows.

Type III curve (Fig. 6) similar to Type II except inverted. The upper portion of the curve is missing and asymptotic disparity occurs for increasing base-in prismatic deviations.

Type IV (Fig. 7) - asymptotic disparity is found for increasing prismatic deviation produced by prisms both base-in and base-out. Clinically it appears that the curve represents a less stable oculomotor fusion relationship and is more susceptible to being altered by treatment.

Mixed types - often it was found that the pattern of the fixation disparity curve obtained for distant fixation differed from that obtained for near fixation. Almost all combinations were found, but more frequently Type III was found at near fixation for these mixed types (Fig. 8).

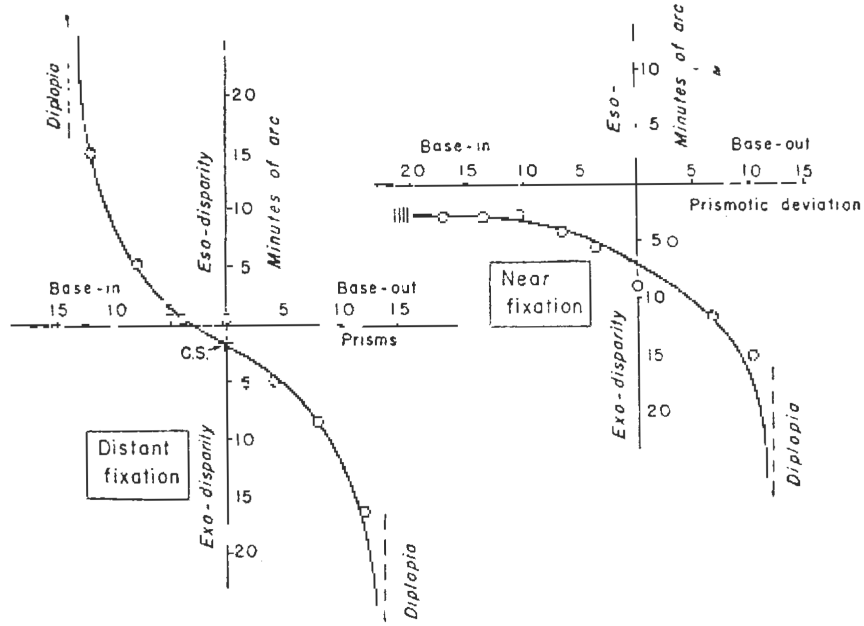


Figure 8 . An example of mixed curves, in which the data for distant fixation gave a type I curve and the data for near fixation gave a type III curve. (From Oculomotor Imbalance in Binocular Vision and Fixation Disparity. Lea and Febiger 1967.)

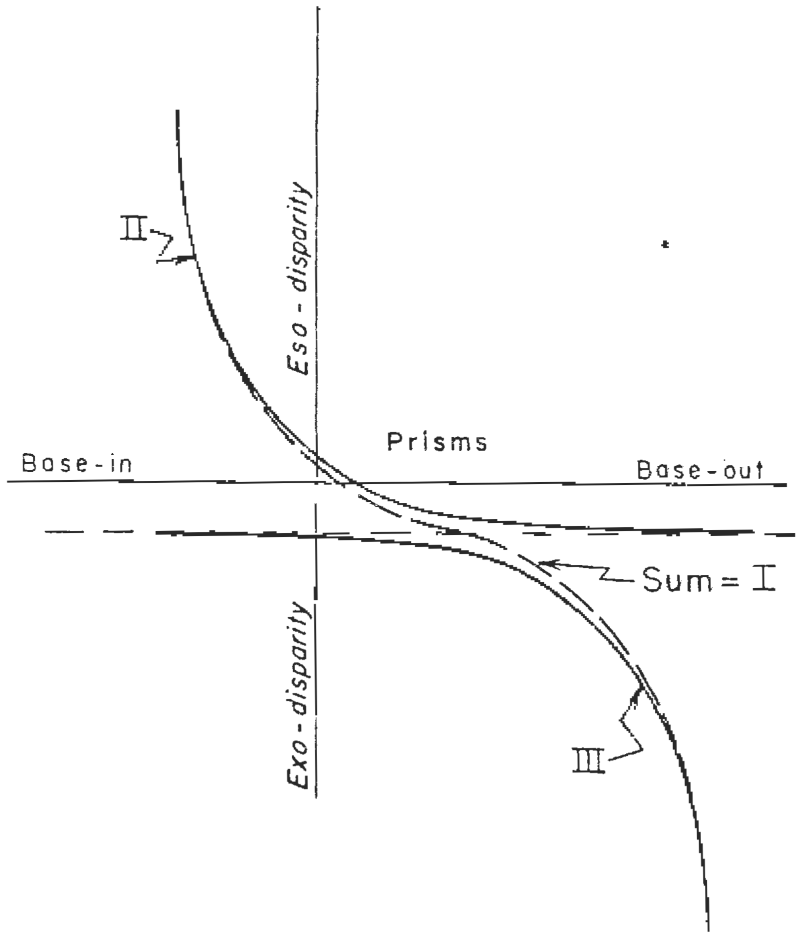


Fig. 9. Diagram showing that a sigmoid fixation disparity-prism curve can be described as the sum of two separate component curves. Modified from Ogle, K. N., and Prangen, A. de H.: Further considerations of fixation disparity and the binocular fusional processes, Am. J. Ophth., 34:57-72, 1951. (From Oculomotor Imbalance in Binocular Vision and Fixation Disparity. Lea and Febiger 1967).

Ogle mentions that the magnitude of the normal fixation disparity, while usually in the same direction as the heterophoria, correlated poorly, because the magnitude of the disparity depends not only on the heterophoria but also on other unidentified variables. The heterophoria with fusion (or associated phoria) is indicated by that prism vergence for which the disparity is zero.

According to Ogle, et al (1967), fixation disparity is the manifest difference in the tonicity of the extra ocular muscles resulting from the convergence and divergence muscular synergies, together with the influence of mechanical and neurologic limitations of those muscles. The latent diplopia is held in check by the compulsion to fusion reflex. When the eyes are forced to converge or diverge by prisms the tonicity difference is changed, and this in turn is reflected in a change in the fixation disparity.

An analytic study suggested that the sigmoid curve could be described as the composite of two separate curves (Fig. 9).

> "These component curves suggest the activity of two opposing synergies, either muscular or innervational, the upper curve describing the action of a convergence synergy, the lower curve the action of a divergence synergy. The algebraic sum of the actions of the two would give the resultant sigmoid oculomotor imbalance curve evidenced by the actual fixation disparities measured with prisms.
>
> The shape of these two components obviously is not due entirely to the behavior of the convergent muscular synergy along or the divergent muscular synergy alone, for each must include also the

possibility of some restraining physiologic or anatomic limitations to the disjunctive movements of the eyes. Moreover, the particular behavior of each will reflect the resultant innervation of the accommodation-convergence association, as this association may react differently to the stress caused by lenses or prisms and to the visual test distance." (Ogle, et al, 1967).

Of particular interest is the effect of orthoptics on the curves. They state that it appears such training does not change the dissociated phorias significantly but that in several instances, there were changes in the characteristics of the disparity curves. Changes in the characteristics of the fixation disparity curves to lenses or prisms or both would be manifest therefore as a change in the AC/A ratio as determined by fixation disparity.

Arner, et al (1956) attempted to provide a preliminary evaluation of the utilization of fixation disparity. A similarity was noted among the graphs of students who had received convergence training. Their graphs showed long flat slopes over wide forced vergence ranges this indicating that fixation disparity was held constant as the vergence changed. These students were initially troubled by severe asthenopic difficulties which were eliminated after the vision training program (Figs. 10a and 10b).

On the other hand, the graphs of several orthoptic patients with asthenopic complaints showed limited vergence ranges with large increases in fixation disparity with small vergence changes. Ogle, et al (1967) too, felt that individuals possessing graphs with long flat slopes had better fusional ability.

For measurements made at 2.5 m, the correlation between asthenopia and a rank ordering of the graphs of fixation disparity as a function of vergence for thirty-five cases was found to be +0.59.

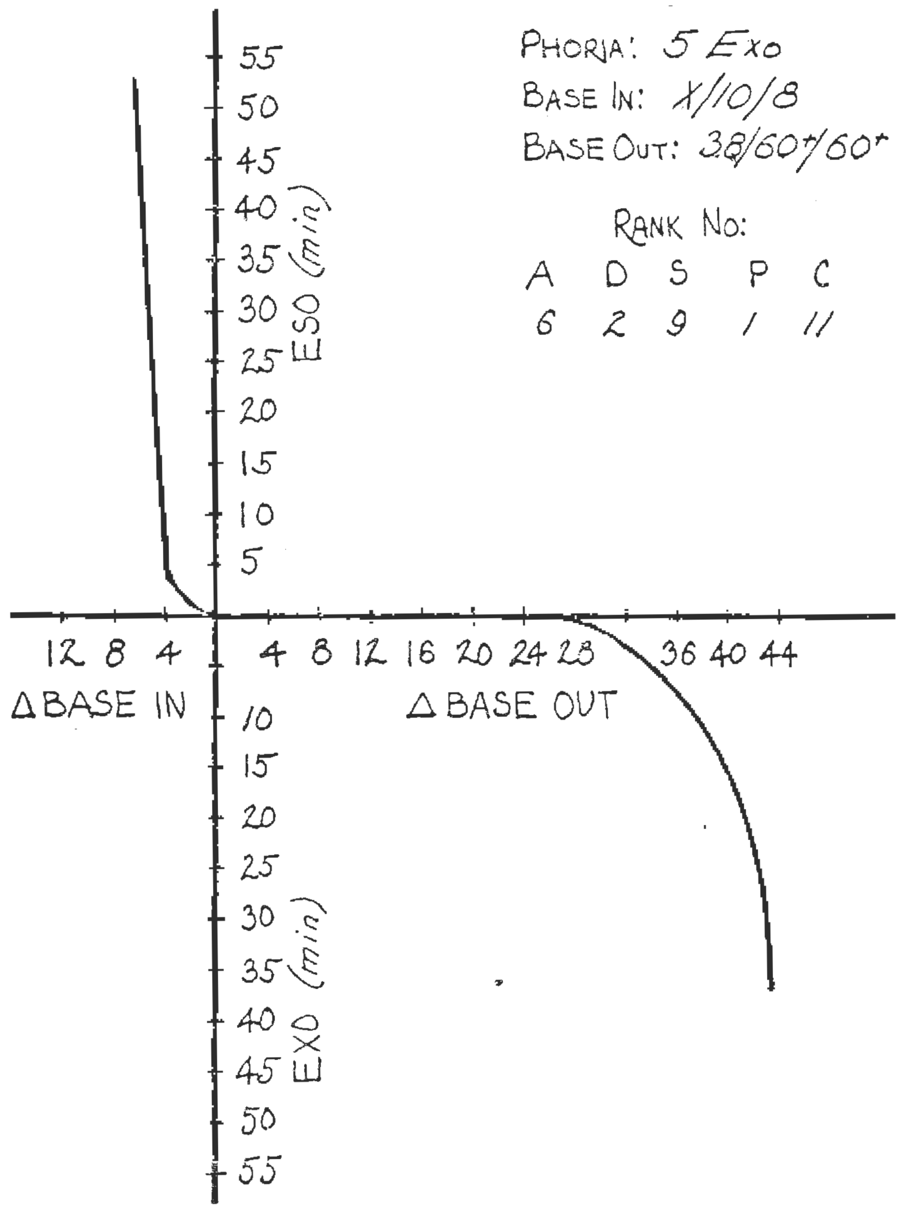


Figure 10a A graph considered "good" by the investigators. (From Arner et al, Amer. J. Optom. and Arch. Amer. Acad. Optom., 33:399-409.

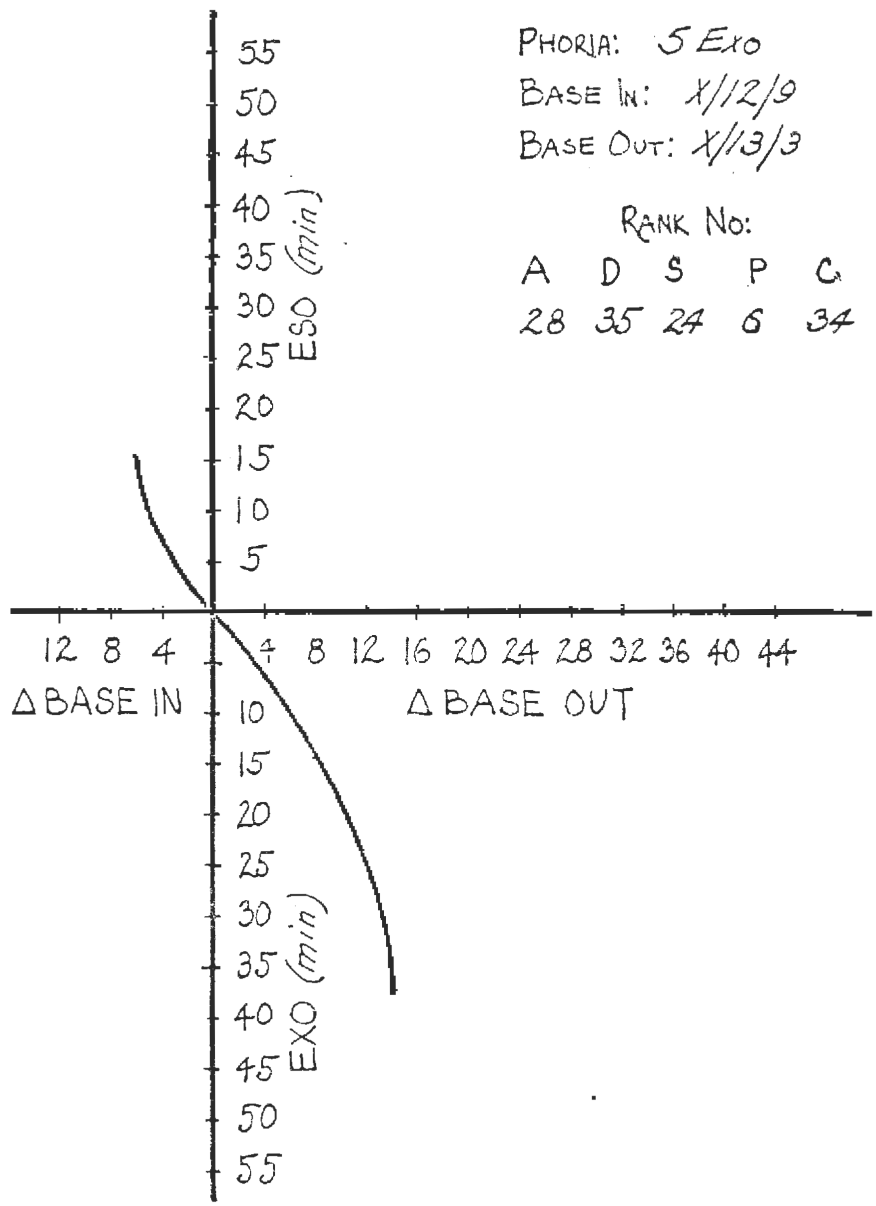


Figure 10b A graph considered "poor" in the evaluation. (From Arner et al, Amer. J. Optom. and Arch. Amer. Acad. Optom., 33:399-409.

CHAPTER IV

EXPERIMENTAL PROCEDURE

SUBJECT SELECTION

A diverse group of twenty subjects were selected on a basis of their fixation disparity responses at 40 cm. (See "Procedure for Determination of Characteristics of Fixation Disparity") This selection was made because we had no previous experience to determine if the effects of training would vary with magnitude of fixation disparity. Subjects were selected to approximate a continuum of magnitudes of fixation disparity from exo-disparity, through the ortho-disparity point to eso-disparity.

In addition to the fixation disparity response, subjects that had no history of (1) strabismus, (2) amblyopia, (3) suppression and (4) severe refractive problems were acceptable. In addition subjects had to be capable of attaining a visual acuity of 20/20 at distance and near (monocularly and binocularly). No forms of visual training other than was being administered by the investigator were permitted.

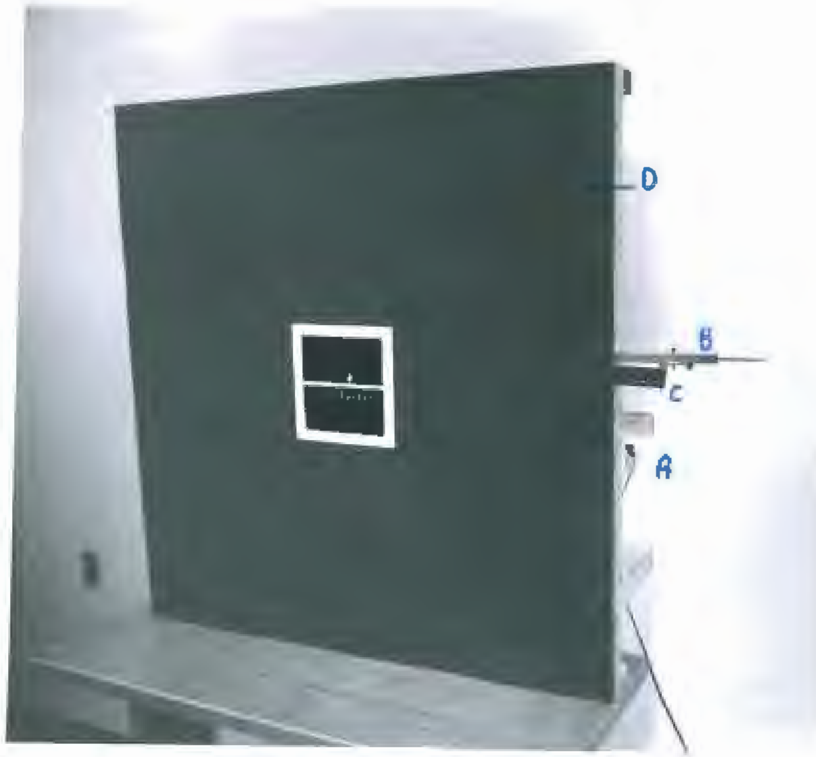
The range of fixation disparity selected extended from 23'36" of arc exo-disparity to 30'26" of arc eso-disparity. Thirteen subjects had exo-disparities and seven eso-disparities (See Table II).

DETERMINATION OF THE CHARACTERISTICS OF FIXATION DISPARITY

Apparatus

A photograph of the apparatus for determination of the magnitude of fixation disparity and characteristics of the curves of fixation disparity due to induced lenses and lateral prisms is shown in Figures 11a and 11b. The magnitude of fixation disparity was determined at three different distances, 4.25 m, 40 cm and 20 cm, and the same target dimensions (angles of subtense) and basic construction were used at all distances. Each subject viewed the target through a Bausch and Lomb Greens refractor which contained the habitual refractive correction for the testing distance. A pair of removable and adjustable cross polarised plates were attached to the phoropter to control the monocular stimulus elements to each eye.

The target subtended 15° visual angle, the square border of the binocular display 2.5° visual angle. (Figure 11 displays the test target). A horizontal binocular white line bisected the display in order to minimize any vertical fixation disparity which might have interfered with measuring the magnitude of the lateral disparity. The horizontal line controlled cyclorotational fixation disparity. Rear illumination was used to render the monocular test objects visible to the subject. A septum placed behind the target prevented light scattering between the two monocular halves. High contrast (Kodalith) film was used to photograph the test objects. The negatives, when back illuminated, produced white symbols against a black background. The binocular display was illuminated by an external light source. Luminance values of the



A. Manual switch, used to flash intermittently illuminates and occlude upper arrow.
B. Vernier caliper
C. Rigid strip attaching upper arrow to vernier caliper.
D. matt black surround subtending 15° visual angle.

Figure 11a, Apparatus used to determine the magnitude and characteristics of lateral fixation disparity.

E. Binocular display subtending 2.5° visual.
F. Upper arrow showing lateral displacement.
G. Lower immobile arrow and 20/20 numbers.

Figure 11b, Close-up of binocular display and monocular elements.

apparatus are shown in Table 1. Polaroid was placed over the symbols in such a way that when viewed by the subject through the analyzing plates, the lower half was seen by the left eye and the upper half by the right eye. The lower half contained a row of 20/20 numbers which were used as a subjective control by enabling a subject to report relative blur and blur-out points. By using 20/20 numbers and instructing the subject to keep them clear and readable it was hoped that accommodation would be controlled as a significant response variable. An arrow above the central number was used as the reference point. A similar arrow above the horizontal bisecting line seen by the right eye could be displaced horizontally. This was achieved by attaching the film to a rigid backing which in turn was attached to a vernier caliper (at near it was attached to a micrometer depth gauge). Any displacement of the arrows could thus be read off directly on the scale of the caliper or depth gauge. At 4.25 m the scale was divided into 38 arcsec intervals, at 40 cm into intervals of 13 arcsec, and at 20 cm into intervals of 26 arcsec. Calibration of the equipment on subjects showed that the displacement of the two arrows could be determined easily within an accuracy of 1 arcmin (see Appendix B for calibration procedures and results). Measurements were thus made to an accuracy of 1 arcmin. The top arrow could be illuminated or occluded by the examiner by means of a manually operated switch. No ghosting due to inefficient cross polarization was visible. At 40 cm and 20 cm, the test box was suspended from the near point rule attached to the refractor.

TABLE 1 - LUMINANCE LEVELS		
	4.25 m	40 cm and 20 cm
White border	2.6 ft. lamberts	0.934 ft. lamberts
Upper arrow	6.8 ft. lamberts	2.44 ft. lamberts
Lower arrow and numbers	5.6 ft. lamberts	2.44 ft. lamberts
Black surround	0.12 ft. lamberts	0.104 ft. lamberts

Procedure

After the subject had been selected based on the magnitude of the lateral fixation disparity at 40 cm and criteria as stated under subject selection, an Optometric examination was carried out. If spectacles and/or contact lenses were worn and a prescription was recent (within one year), it was used for the duration of the project. The lens for subjects who wore no refractive correction or where the refractive correction was older than one year was determined from the examination.

1. Subject Training

The refractor was adjusted to the subject's inter-pupillary distance. The polaroid plates were removed so that the whole target could be viewed binocularly. The subject was instructed to (1) determine and report subsequent to any lens changes and during the measurement procedure (a) distinct and readable, (b) blurred but readable, (c) extremely blurred and not readable or (d) the row of numbers had doubled, (2) look at the lower arrow and not at the top arrow as it was intermittently flashed, but to be aware of whether the top arrow was seen to the right or left of the bottom arrow, and (3) report the position of the arrow whenever it was flashed, e.g., "Right, right, aligned." The method of limits was demonstrated to each subject until the procedure was understood. The investigator displaced the arrow to the right hand side and between flashes reduced the lateral displacement until the subject reported the arrows as being aligned one over the other. The procedure was repeated with the arrow displaced to the left hand side. All subjects easily learned the alignment task.

2. Measurement

The magnitude of fixation disparity was determined at 4.25 m. Polaroid plates were inserted and the subject instructed to look at the 20/20 numbers for thirty seconds. The top arrow was displaced to the right and between flashes the "disparity" was reduced until the subject perceived the arrows as being vertically aligned. Lateral displacement of the top arrow from true alignment was read off on the scale and converted to a corresponding angular subtense. This was recorded and the procedure was repeated from the left hand side. Five pairs of readings were taken in order to determine the average fixation disparity value.

The curves of fixation disparity to forced vergence were determined next. Due to the problems of individual variations in the rate of prism adaption, and lens adaption, one pair of readings was taken for each value. Fixation disparity was measured as soon as the patient reported on the appearance of the numbers. Here too, the method of limits was used to determine the magnitude of disparity at each prism and lens value. Prisms base-out and base-in were placed alternately before the subject's eyes to minimize adaption. Increments of four prism base-out and two prism base-in were made.

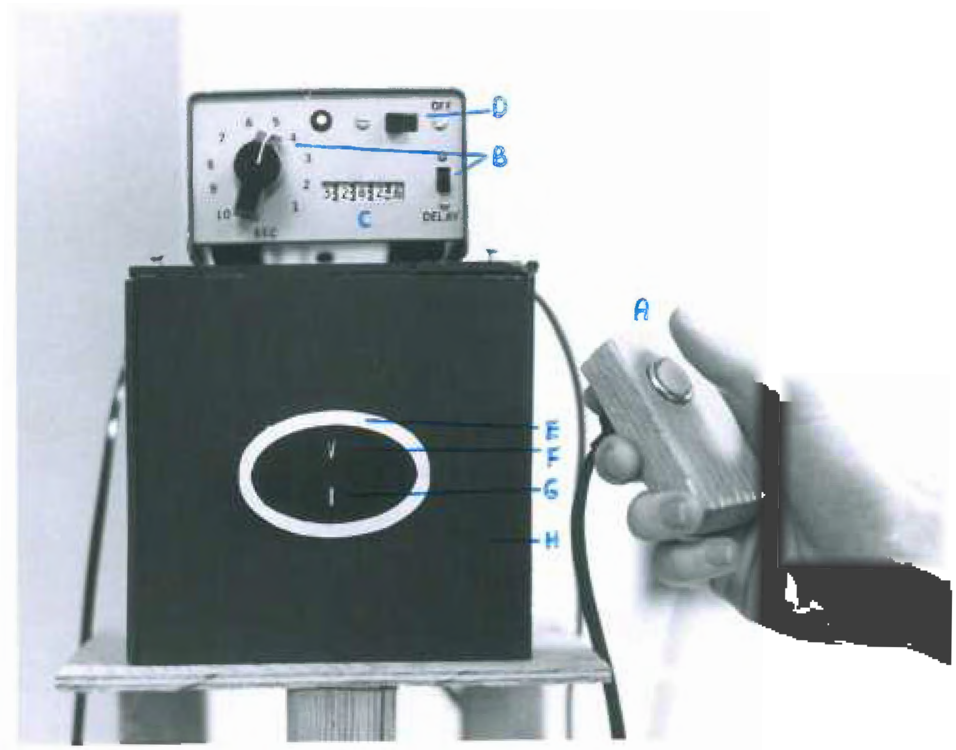


Figure 12a. Visual-feedback training apparatus.

A. Manually operated switch which when depressed illuminates binocular control elements (Figure 12b).
B. Stimulus delay in "on" position. Binocular stimulus will be illuminated for 5 seconds. (In "off" position length of stimulus is illuminated dependent on length of time switch A is depressed.
C. Electronic counter which registers the frequency the control stimulus is used.
D. Apparatus On/Off switch.
E. Binocular display subtends 8.5° visual angle.
F. Red chevron.
G. Green lines separated by 2 minutes of arc (film did not resolve).
H. Matt black surround subtenuinding 20° visual angle.

Figure 12b. Visual-feedback apparatus
A. Switch depressed.
I. Binocular control element illuminated

The same procedures were followed when plotting the curves of fixation disparity to induced lenses. Plus spheres and minus spheres were alternated and increases were made in half diopter steps. Readings were halted when any one of the following responses was obtained: (1) diplopia was experienced, (2) the numbers could no longer be distinguished (recorded as blur-out), (3) the numbers were alternately reported seen and not seen, (4) the numbers before the left eye moved excessively and the subject reported the top arrow as "jumping around", (5) +2.50 and -2.50 spheres if the numbers were still readable, (6) 40 prism base-out and 40 prism base-in if the numbers were still single and readable. Rest periods were taken between each section, i.e., after the average magnitude of fixation disparity had been determined, after measuring the change in fixation disparity to forced vergence and when changing the test distance.

Subject training was repeated at 40 cm. The forced prism and sphere procedures described above were followed when testing at 40 cm. Only the average magnitude of fixation disparity was determined at 20 cm (five pairs of readings were made).

VISUAL-FEEDBACK TRAINING

Apparatus

Training was carried out at 40 cm and 1 m. Two boxes were constructed to produce optically identical stimulus conditions. Photographs of the apparatus are displayed in

Figures 12a and 12b. The target subtended 20° and the oval binocular display 8.5°. Red/green filters ensured that the red chevron and green lines were seen monocularly when the corresponding filters were placed before the subject's eyes. The chevron and vertical lines were the target features used for training more precise binocular fixation. A chevron and lines were used in preference to lines in order to minimize the probability of an unwanted fusion stimulus and therefore alignment, during the training. The green lines were constructed with a separation of 2' of arc at the test distance. The binocular control element was connected to a manually operated switch "A". A stimulus delay "B" enabled the investigator to adjust the length of time the intermittent stimulus remained visible to the subject during certain phases of training. For the rest, the duration of stimulus was controlled by the subject.

Procedure

Training was commenced at the 40 cm distance. The habitual refractive correction, if required, was placed in a trial frame together with the red/green filters. The subject was instructed to view the training apparatus and asked to report on the relative positions of the chevron and lines. If a fixation disparity was present the chevron and lines (monocular control elements) were seen as being displaced laterally. When the switch "A" was pressed, the binocular stimulus served to align the monocular targets if a binocular fixation was made for this control element. The binocular control was perceived as having "lustre", a combination of red and green, under these conditions. Two separate lines, one red and the other green, indicated that the subject was unable to fuse the binocular stimulus. The presence of one line, either red or green, demonstrated color and/or contour suppression of the eye corresponding to the missing color.

During the first five minutes of each training session the delay "B" was set so that when activated, the binocular stimulus would remain illuminated for five seconds. This was done so that a record of the subject's ability to control the fixation disparity was obtained as training progressed. All subjects were carefully indoctrinated as to this part of the procedure. They were instructed to press the switch as soon as the monocular targets were perceived as being out of alignment. The targets were considered as being out of alignment as soon as the chevron moved beyond either green line, i.e., a fixation disparity of greater than 2' of arc was present. Instructions were that they were <u>not</u> to consciously align the targets. An electronic counter connected to the delay counted the number of times the binocular stimulus was used to align the monocular targets.

For the rest of the training session the delay was disconnected and the length of time the binocular control remained on was controlled by the subject. Training consisted of (1) using prisms of increasing power base-in and base-out to induce sudden vergence changes. Base-in prism induced eso-disparities and base-out prism produced exo-disparities when the vergence response was not equal to the stimulus level. (2) using positive and negative spheres to produce changes in the vergence response. Changes in fixation disparity by positive and negative spheres were produced through interaction between the accommodative and convergence responses. Typically, increased accommodative activity brought about increased convergence activity. Similarly reduction in accommodative activity produced a reduced convergence response. Minus lenses tended to increase the magnitude of eso-disparity and decrease exo-disparity. Plus lenses tended to decrease the magnitude of eso-disparity and increase exo-disparity.

The subject was instructed to align the monocular targets, as prisms and lenses were introduced by using the binocular stimulus to aid in the establishment of correct accommodative and vergence responses to the essential stimulus elements. As training progressed the subject was instructed to align the monocular stimulus elements without the aid of the binocular stimulus. He was instructed to use the control stimulus as infrequently as possible. Training at the 1 m distance was begun as soon as the subject demonstrated the skill to easily align the targets at 40 cm even with induced prism and lenses.

Training Criteria

When the binocular stimulus was used five times or less to align the monocular stimulus elements during three successive training sessions, a subject was considered to have met training criteria. In addition, criteria had to be met at the 40 cm and 1 m training distances. The lens and prism values used at 40 cm were (a) 10 prism diopters which was alternated from base-in to base-out for ten cycles, (b) +1.50 and -1.50 diopter spheres which were alternated for ten cycles. The prism value used at 1 m was six prism diopters which was alternated from base-in to base-out for ten cycles. As the lenses and prisms were introduced subjects had to report that the monocular elements were clear and that alignment had occurred within three seconds without the use of the binocular stimulus.

CHAPTER V

RESULTS

The effects of the training on lateral fixation disparity were first studied first by comparing individual subject changes, secondly by comparing changes in the central tendencies of the group and thirdly the data was examined to determine whether or not distinct patterns of response could be found within the groups.

MAGNITUDE OF FIXATION DISPARITY AT 40 cm

To determine whether the magnitude of fixation disparity was reduced at 40 cm the following analyses were made:

(a) Individual learning curves of the flash frequency of the intermittent control stimulus versus time (training sessions) were plotted. Inspection of the individual learning curves showed that all subjects demonstrated a reduction over time of the flash frequency of the intermittent control stimulus. Figure 13 shows a typical response. As training progressed there was a rapid reduction in flash frequency which asymptotes during the last few sessions. Note the rapid reduction in flash frequency which occurred during the first and second training session.

(b) Group learning curve of flash frequency of the intermittent control stimulus versus time (training sessions) were plotted. Figures 14 and 15 graphically display the

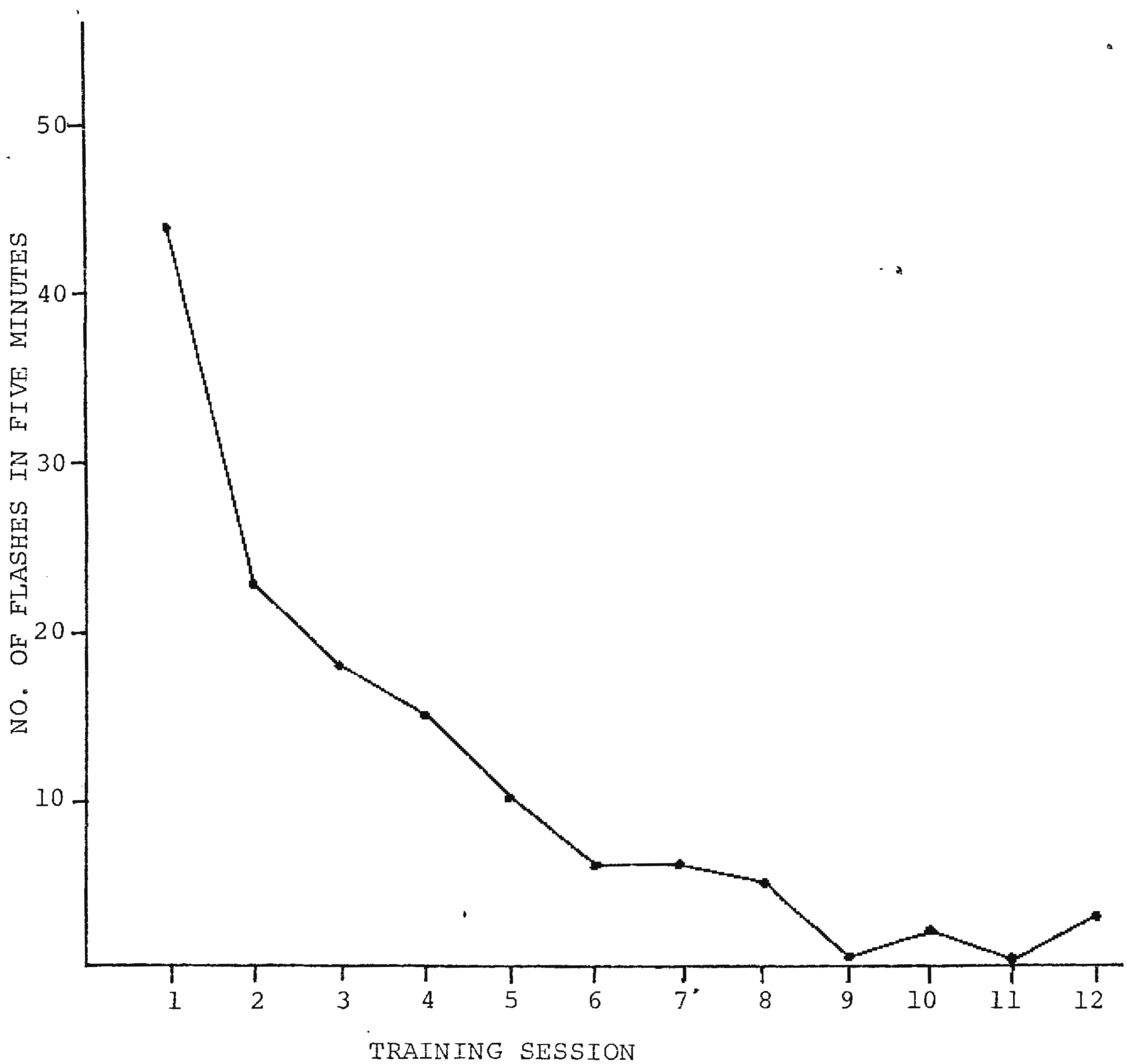


Figure 13 Subj: D.S. (1) INDIVIDUAL LEARNING CURVE

Number of flashes in five minutes is plotted on the ordinate against the number of training sessions on the horizontal axis. (Graphs for all other subjects included in Appendix E.)

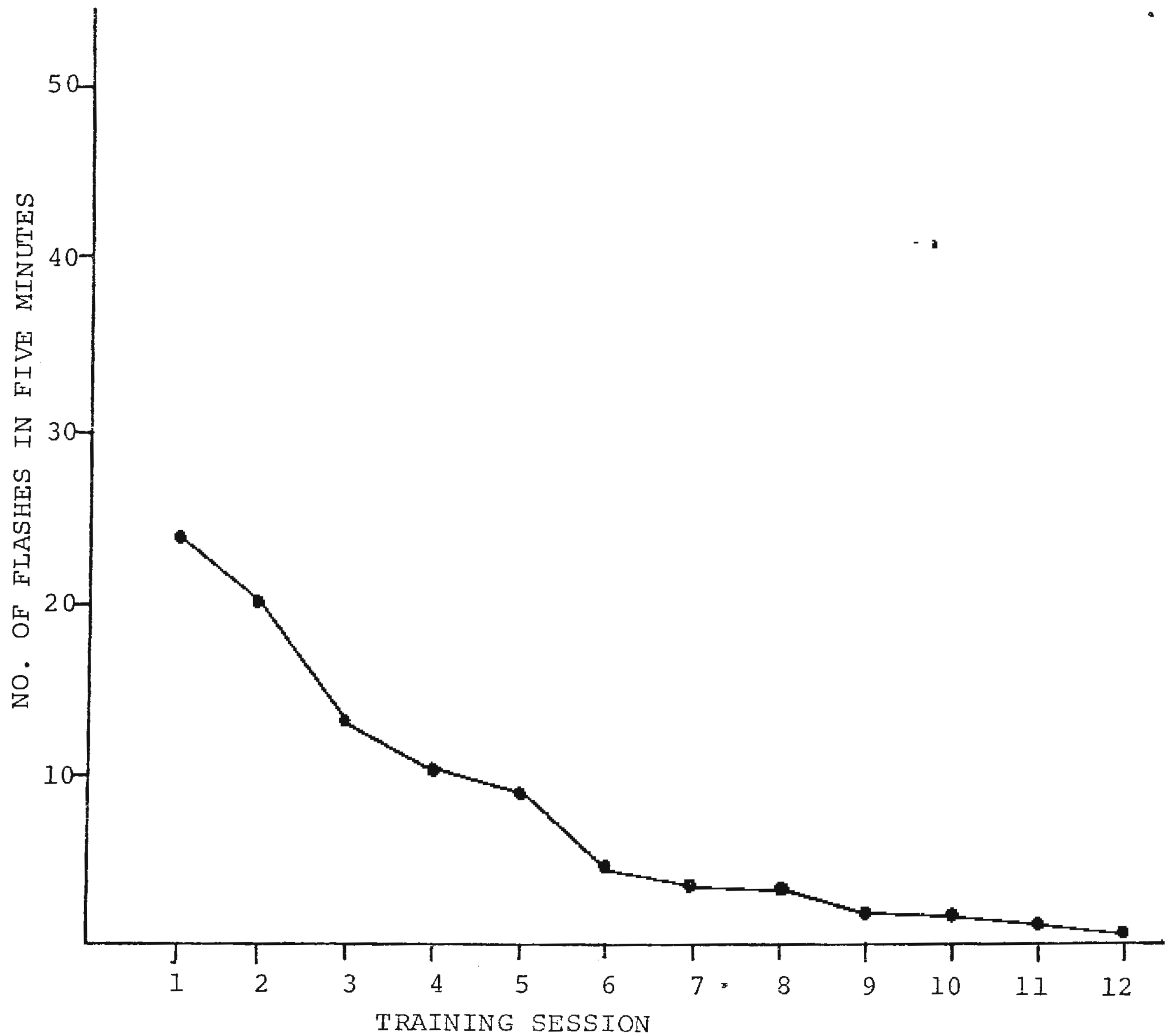


Figure 14 Group Data: Median for Each Training Session at 40 cm.

N = 20

● = median value

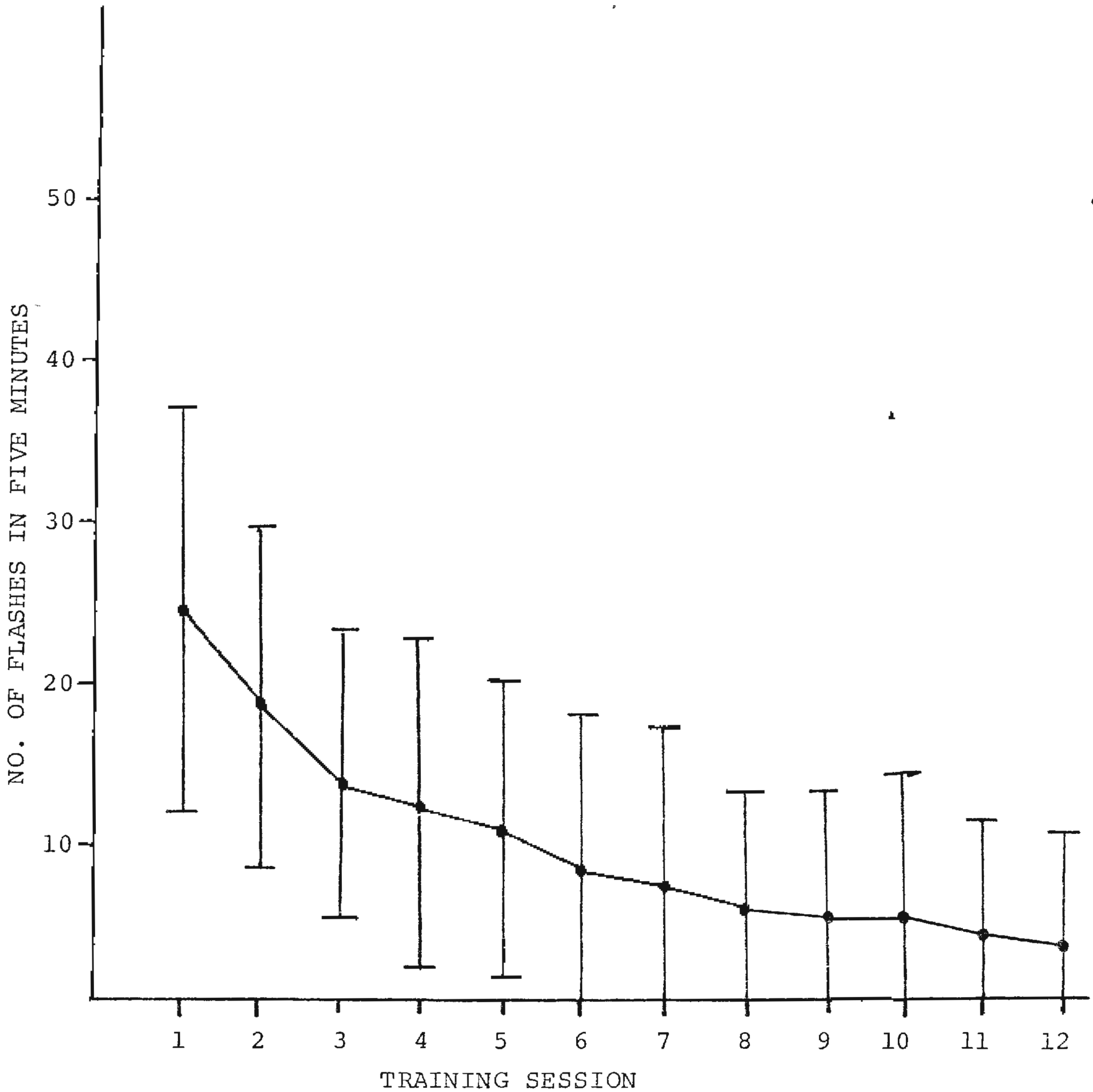


Figure 15 Group Data: Mean and Standard Deviation for Each Training Session at 40 cm.

N = 20
● = mean
I = standard deviation

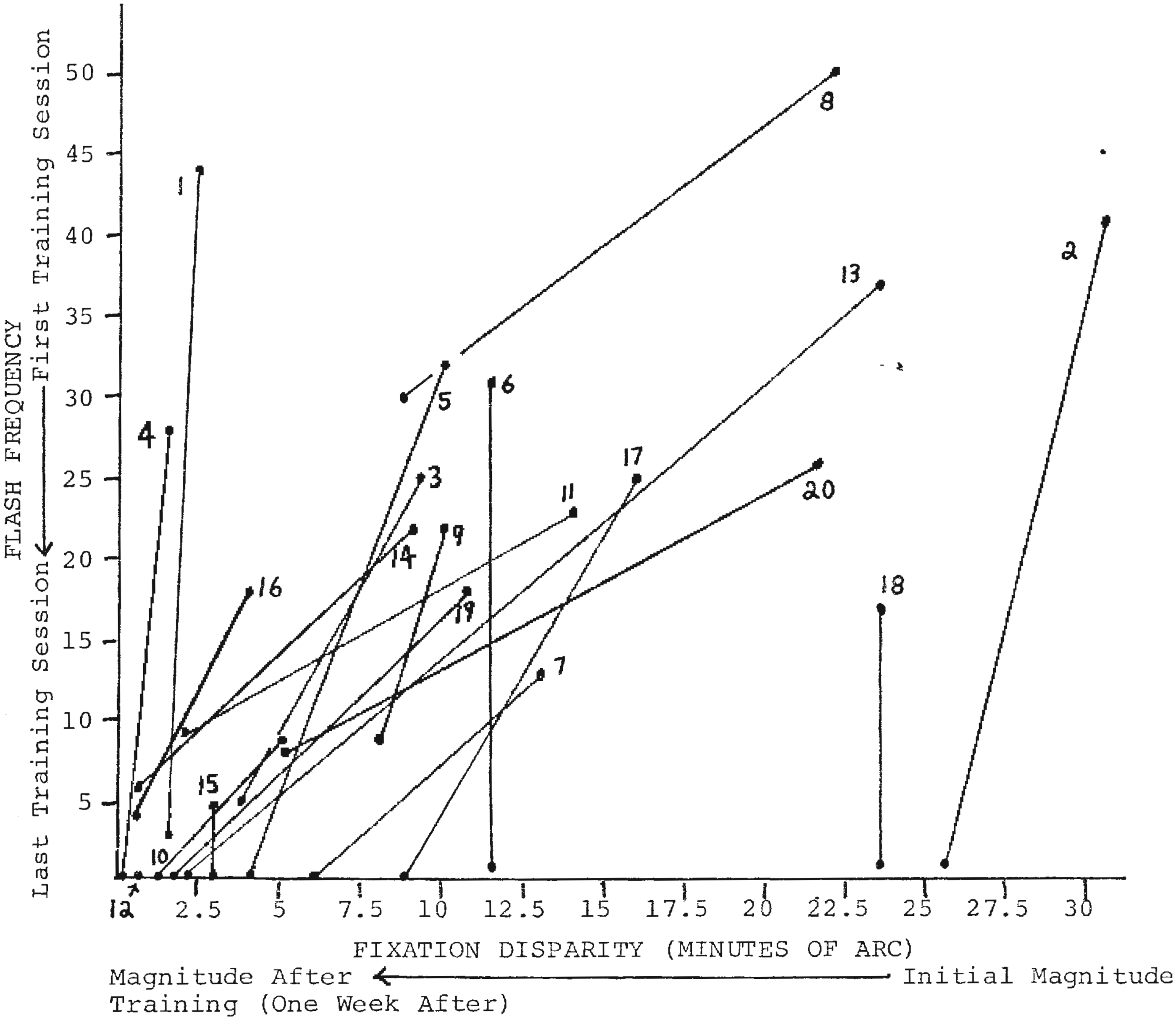


Figure 16

Graph shows the effect of the training on the magnitude of fixation disparity at 40 cm. As the flash frequency decreases there is a corresponding decrease in magnitude of fixation disparity in 17 of the 20 subjects. Subjects 6, 15 and 18 showed no change.

TABLE II. Frequency Distribution of Magnitude of Fixation Disparity at 40 cm, 20 cm, 4.25 m Before the Commencement of Training.

Fixation Disparity (Intervals in Minutes of Arc)	40 cm		20 cm		4.25 m	
	Eso-Disparity	Exo-Disparity	Eso-Disparity	Exo-Disparity	Eso-Disparity	Exo-Disparity
0 ± 2	1	1	2	1	5	5
3 - 7	2	2	1	3	5	3
8 - 12	1	5	1	4	1	0
13 - 17	0	3	1	3	0	0
18 - 22	1	1	0	1	0	0
23 - 27	1	1	0	1	0	0
28 - 32	1	0	0	0	1	0
33 - 37			1	0		
	N = 7	N = 13	N = 6	N = 13	N = 12	N = 8
	N = 20		N = 19		N - 20	

TABLE III. DECREASE IN MAGNITUDE OF FIXATION DISPARITY AT 40 CM.

FIXATION DISPARITY INTERVALS IN MINUTES OF ARC	FREQUENCY OF SUBJECTS WITHIN INTERVALS AT 40 CM.		
	A Pre-Training—one week post training	B Pre-Training—six weeks post-training	C One week post—six weeks post-training
$^{-}5$ - $^{-}7$			
$^{-}2$ - $^{-}4$		1	4
0—($^{-}1$ to $^{+}1$)	6	3	8
2 - 4	3	5	5
5 - 7	5	2	2
8 - 10	2	4	
11 - 13	2	2	1
14 - 16	1	1	
17 - 19		1	
20 - 22	1	1	
23 - 25			
26 - 28			
29 - 31	N=20	N=20	N=20
FREQUENCY INCREASED	0	1	4
DECREASED	14	16	[illegible]
STATISTICALLY SIGNIFICANT (α=.05)	Yes	Yes	No

median and mean and standard deviation of the sample. By inspection there is a decrease in the mean flash frequency of the intermittent control stimulus over time and the position of the median value approaches zero-flashes. A t-test for related samples shows a statistically significant difference between the mean frequency of flashes for the first session of training and the mean frequency of flashes for the last session of training. ($t=8.0654$, $df=N-1$) Figure 16 shows that the decrease in magnitude of fixation disparity is related to reduction in flash frequency of the binocular stimulus. It may be assumed that the reduction in magnitude is a result of the training procedures.

(c) Nonparametric statistical tests were used to analyze the changes in magnitude of fixation disparity. The Sign Test was used because the data was of such a nature that more complex statistical tests with their accompanying assumptions were not required. Data were analyzed to determine the practice effect one week after training had decreased (approached zero) compared with the magnitude before training a plus sign was awarded. Magnitudes recorded within ± 1 minute of arc were regarded as having no measurable difference and were assigned zero scores. Zero scores were disregarded when determining the levels of statistical significance. A level of significance of $\alpha=0.05$ for one tailed test had been selected previously in designing the experiment. Table II represents the frequency distribution of the magnitude of fixation disparity at 40 cm, 20 cm and 4.25 m before training commenced.

Statistically significant differences were found between the magnitudes of fixation disparity before and one week after training. Table III, column A, represents the frequency distribution of subjects showing changes in magnitude of fixation disparity at 40 cm, over this period. No subject showed an increase in the magnitude of fixation disparity. Fourteen subjects showed a reduction in the magnitude of fixation disparity. Of the six subjects in which no measurable change was demonstrated, four (numbers 1, 4, 12 and 15) showed a disparity of less than three minutes of arc before training commenced.

(d) Statistically significant differences were found between the magnitudes of fixation disparity before training and six weeks after the cessation of training. (See Table III, Column B). Sixteen subjects showed a decrease in the magnitude of fixation disparity. One subject showed an increase from thirty-three seconds of arc eso-disparity to one minute fourty-four seconds of arc eso-disparity. Three subjects (again numbers 1, 4 and 15) showed no change.

(e) No statistically significant difference was found between the magnitude of fixation disparity one week after training and six weeks after training (see Table III, Column C). This indicates a stable practice effect. Eight subjects showed a further reduction in magnitude between two and thirteen minutes of arc, eight subjects showed no measurable change and four subjects showed an increase in magnitude between two and four minutes of arc.

TABLE IV. GROUP DECREASE IN MAGNITUDE OF FIXATION DISPARITY AT 20 CM AND 4.25 M.

Frequency of Subjects Showing Transfer of Practice Effect	Pre-training—One week Post-training	Pre-training—Six weeks Post-training	One week post—Six weeks Post-training
	20 cm		
DECREASED	15	19	9
INCREASED	0	0	0
NO CHANGE	5	1	11
STATISTICALLY SIGNIFICANT	Yes	Yes	Yes
	4.25 m		
DECREASED	3	5	2
INCREASED	3	0	0
NO CHANGE	14	15	18
STATISTICALLY SIGNIFICANT	No	Yes	No

The data indicate that there has been a significant decrease in the magnitude of fixation disparity due to transference of the practice effect.

DECREASE IN THE MAGNITUDE OF FIXATION DISPARITY AT 20 cm AND 4.25 m.

The Sign Test was used to statistically determine whether the practice effect at 40 cm had transferred to the other test distance, 20 cm and 4.25 m. See page 47 for method of use.

(a) A statistically significant difference was found at 20 cm when comparing the magnitudes of fixation disparity before and one week after training. Table IV shows the frequency of subjects showing transference of the practice effect from 40 cm to 20 cm. Fifteen subjects showed a reduction in the magnitude of fixation disparity. No subjects showed an increase and five subjects showed no measurable change. Two of these subjects, 8 and 15, had magnitudes of less than three minutes of arc before training. A statistically significant difference was found before and six weeks after training. No subjects showed an increase and only one subject, number 15, showed no measurable change. A statistically significant difference was found between the magnitudes of fixation disparity one week after and six weeks after training. No subjects showed an increase and nine subjects showed a further reduction in magnitude indicating that the effects of training were not only stable but were continuing after training had ceased.

(b) The magnitude of fixation disparity at 4.25 m before training and one week after training showed no significant differences. It must be remembered that the selection of subjects was based on the magnitude of fixation disparity at 40 cm and that the investigator had no knowledge of the magnitude of the disparity at 4.25 m. This is significant when one considers the number of subjects who showed no measurable change. Of the fourteen subjects showing no change at 4.25 m, ten had magnitudes of fixation disparity of three minutes of arc or less before training commenced. Three subjects showed an increase in the magnitude fixation disparity between two and four minutes of arc, while three subjects showed a decrease in the magnitude of fixation disparity between two and seven minutes of arc. When the magnitudes before training and six weeks after training were compared, a statistically significant difference was found. Six weeks after training no subject showed an increase, fifteen showed no measurable change, while five subjects showed a reduction in the magnitude of fixation disparity between two and seven minutes of arc. No statistically significant difference was found when comparing the magnitudes of fixation disparity one week after and six weeks after training. This shows high retention and further improvement in this fixation skill. Two subjects showed a further reduction, while eighteen showed no measurable change in magnitude.

An analysis of the magnitudes of lateral fixation disparity at the three test distances was made to determine whether there had been a decrease in the motor response lag of convergence as measured by lateral fixation disparity. The

INTERVALS IN MINUTES OF ARC	TABLE V. MOTOR RESPONSE LAG OF FIXATION DISPARITY FREQUENCY OF SUBJECTS WITHIN INTERVALS FOR THE THREE TEST DISTANCES		
	40 cm - 4.25 m PRE-V.T. — 6 WKS. POST-V.T.	20 cm - 4.25 m PRE-V.T. — 6 WKS POST-V.T.	20 cm - 40 cm PRE-V.T. — 6 WKS POST-V.T.
⁻17 - ⁻19		1	
⁻14 - ⁻16		0	1
⁻11 - ⁻13		0	0
⁻8 - ⁻10		0	0
⁻5 - ⁻7		0	0
⁻2 - ⁻4	1	1	1
0±(⁻1 to ⁺1)	6	4	8
2 - 4	1	7	2
5 - 7	5	1	1
8 - 10	4	1	1
11 - 13	1	1	3
14 - 16	0	1	1
17 - 19	1	1	0
20 - 22	1	1	1
FREQUENCY INCREASED	1	2	2
DECREASED	13	13	9
STATISTICALLY SIGNIFICANT (α=.05)	Yes	Yes	Yes

The data indicate that there has been a significant reduction in the motor response lag of fixation disparity. This indicates an improved response to the test stimulus.

TABLE VI - GROUP DECREASES IN MAGNITUDE OF FIXATION DISPARITY DUE TO INDUCED LENSES AND PRISMS AT 40 CM.

FREQUENCY OF POINTS TESTED IN EACH CATEGORY	BASE-OUT PRISM			BASE-IN PRISM		
	PRE-TRAINING— ONE WEEK POST-TRAINING	PRE-TRAINING— SIX WEEKS POST-TRAINING	ONE WEEK POST— SIX WEEKS POST-TRAINING	PRE-TRAINING— ONE WEEK POST-TRAINING	PRE-TRAINING— SIX WEEKS POST-TRAINING	ONE WEEK POST— SIX WEEKS POST-TRAINING
DECREASED	70	73	54	59	64	45
INCREASED	5	3	18	20	14	25
NO CHANGE	15	13	40	29	27	45
STATISTICALLY SIGNIFICANT $\alpha = .05$	YES	YES	YES*	YES	YES	YES*
	POSITIVE SPHERES			NEGATIVE SPHERES		
DECREASED	49	58	24	33	31	18
INCREASED	4	5	15	9	9	15
NO CHANGE	25	18	42	17	17	32
STATISTICALLY SIGNIFICANT $\alpha = .05$	YES	YES	NO	YES	YES	NO

The data indicate that there has been a significant decrease in the magnitude of fixation disparity across the range of prisms and lenses dur to transference of the practice effect. No statistically significant differences in the third columns indicates that the skills learned during training are still present.

*There has been a further significant decrease in magnitude.

TABLE VII - GROUP DECREASES IN MAGNITUDE OF FIXATION DISPARITY DUE TO INDUCED LENSES AND PRISMS AT 4.25 M.

FREQUENCY OF POINTS TESTED IN EACH CATEGORY	BASE-OUT PRISM			BASE-IN PRISM		
	PRE-TRAINING—ONE WEEK POST-TRAINING	PRE-TRAINING—SIX WEEKS POST-TRAINING	ONE WEEK POST—SIX WEEKS POST-TRAINING	PRE-TRAINING—ONE WEEK POST-TRAINING	PRE-TRAINING—SIX WEEKS POST-TRAINING	ONE WEEK POST—SIX WEEKS POST-TRAINING
DECREASED	50	46	24	23	21	11
INCREASED	10	4	27	7	5	17
NO CHANGE	37	43	62	21	22	25
STATISTICALLY SIGNIFICANT $\alpha = .05$	YES	YES	NO	YES	YES	NO
	POSITIVE SPHERES			NEGATIVE SPHERES		
DECREASED	7	9	4	23	23	20
INCREASED	0	0	2	8	7	12
NO CHANGE	15	13	18	13	18	34
STATISTICALLY SIGNIFICANT $\alpha = .05$	YES	YES	NO	YES	YES	NO

The data indicate that there has been a significant decrease in the magnitude of fixation disparity across the ranges of prisms and lenses due to transference of the practice effect. No statistically significant difference in the third columns indicates that the skills learned during training are still present magnitude of fixation disparity at 4.25 m before training was subtracted from the magnitude of fixation disparity at 40 cm before training. This value was compared with the corresponding value calculated from the magnitudes of fixation disparity six weeks after training. Similar procedures were undertaken to compare the lags of the 20 cm - 4.25 m distance and even the 20 cm - 40 cm distance, over this time period. The Sign Test shows that statistically significant decreases were found in the motor response lag of convergence as measured by lateral fixation disparity. Table V represents the frequency of subjects who showed decreases in the response lag over the three distances. The motor response lag of convergence of 40 cm - 4.25 m showed a decrease in convergence lag in thirteen subjects, an increase occurring in only one. The motor response lag of convergence of 20 cm - 4.25 m also showed a decrease in thirteen subjects, increases occurring in two subjects. Although only over a short distance, the 20 cm - 40 cm motor response lag of convergence was significantly decreased. Nine subjects showed a decrease in the convergence lag while two showed an increase.

CHANGES IN THE PATTERNS OF LATERAL FIXATION DISPARITY

In order to determine whether the patterns of lateral fixation disparity were subject to this specific form of training the data was treated in the following ways: (a) The Sign Test was used to determine whether there were statistically significant differences before and after training between the magnitudes of fixation disparity across the ranges of base-out prism, base-in prism and positive and negative spherical lenses at 40 cm and 4.25 m. Changes in the magnitude of fixation disparity were calculated by subtracting the magnitude after training from the corresponding magnitude before training. Tables VI and VII represent the frequency of subjects who showed changes in the magnitude of fixation disparity across these ranges, (1) before training and one week after training, (2) before and six weeks after training, and (3) one week and six weeks after training. A significant change towards zero indicates that there has been a group trend resulting in the flattening of the curves of lateral fixation disparity due to induced prisms and lenses (See appendix D for graphical representations). The Sign Test did not show a significant difference in the curves due to induced negative lenses at 4.25 m. Use of the Wilcoxon matched pairs signed-ranks test, however, did show statistically significant differences (flattening) in these curves.

Arithmetic comparison of magnitudes of fixation disparity differences were used rather than attempting to use mathematical equations to describe these changes. The mathematical model derived by Ogle, et al (1967) did not prove to be adequate in describing the curves and therefore changes in the curves (Schor, 1977). The changes at selected points, were adequately described by the Sign and the Wilcoxon matched pairs signed-ranks test. The graphs have been included in Appendix D as visual representations of these changes.

TABLE VIII

DESCRIPTION OF CHANGES IN CURVES OF FORCED VERGENCE AT 40 CM.				
SUBJECT	CHANGE IN ASSOCIATED PHORIA (PRISM DIOPTERS)	CHANGE IN CHARACTERISTICS OF CURVE	CHANGE IN FIXATION DISPARITY (ARCMIN)	MAGNITUDE OF HETEROPHORIA (PRISM DIOPTERS)
1	1 (R)	Rotation	1 (R)	4 Eso
2	No crossing	Lateral shift	10 (R)	18 Eso
3	0	Rotation	6 (R)	9 Exo
4	1 (R)	Rotation	1 (R)	8 Exo
5	2 (R)	Rotation	4 (R)	10 Exo
6	No crossing	None (?)	1 (R)	8 Eso
7	0	Rotation	8 (R)	4 Exo
8	5 (R)	Rotation	18 (R)	12 Eso
9	6 (R)	Lateral shift	4 (R)	12 Exo
10	2 (R)	Base-out	5 (R)	6 Exo
11	0	Rotation	8 (R)	10 Exo
12	0	Base-out	0 (ortho)	ortho
13	9 (R)	Lateral shift	22 (R)	ortho
14	1 (R)	Rotation	6 (R)	4 Exo
15	increase 3	Rotation	2 (R)	(10 exo)-5 Eso
16	1 (R)	Rotation	4 (R)	4 Exo
17	5 (R)	Lateral shift	14 (R)	5 Exo
18	0	Base-in	11 (R)	7 Eso
19	3 (R)	Base-out	8 (R)	9 Exo
20	No crossing	Rotation (?)	10 (R)	7 Exo

*(R) = Reduction in magnitude

Further evidence that there was a smaller error of fixation for a given amplitude of forced vergence was seen on inspection of the curves of fixation disparity at 40 cm. These curves were used because this is the distance at which the initial selection was made and nineteen subjects showed a fixation disparity. (Appendix C for tables and Appendix D for graphical representations). The associated phoria was estimated by finding the point at which the curves crossed the abscissa. Comparison was made of the curves obtained before training and six weeks after training was completed. Table VIII shows that there were ten subjects (numbers 1, 3, 4, 5, 7, 8, 11, 14, 15 and 16) who showed a rotation of the forced vergence curve obtained six weeks after training had been completed. Rotation of the curves implies that there has been a change in the slope of the curve and that there has been an altered response to a given amplitude of forced vergence--a smaller error of fixation. In these subjects the reduction in the magnitude of fixation disparity to forced vergence had been to both base-in prism and base-out prism regardless of the direction of the fixation disparity. Five subjects showed exo-fixation disparity and the other five showed eso-fixation disparity.

Interesting variations were found among the other ten subjects. Three subjects who had exo-fixation disparities (numbers 9, 13 and 17) and one subject who had an eso-fixation disparity (number 2) showed what at first appeared to be a vertical shift of the whole curve. Closer inspection showed however that this apparent vertical shift could be explained on the basis of lateral shifts of the associated phoria. Ogle et al (1967) showed that lateral shifts in the curves could be brought about by the addition of spherical lenses. It was assumed therefore that changes in accommodative response or orthophorization or both had taken place. Three subjects who had exo-fixation disparities (numbers 10, 12 and 19) showed an improved response to base-out prism stimuli only and one subject who had an eso-fixation disparity (number 18) showed an improved response to base-in prism stimuli only. These reductions in magnitude of fixation disparity were opposite to their habitual fixation disparity and could have been the result of adaptation or improved response. The new curves for the three subjects with exo-disparities took on the characteristics of Type II curves (Ogle et al, 1967). Difficulty was experienced describing what had occurred with two subjects, numbers 6 and 20.

Summary of Results

Results achieved by this experiment indicate that a new clinical tool has been developed for directly modifying the vergence response of patients, as measured by lateral fixation disparity. The extent to which the vergence response can be modified in clinical subjects with diagnosed vergence dysfunctions can not be accurately predicted until these procedures have been applied to a clinical population.

CHAPTER VI

DISCUSSION OF RESULTS

The success of this type of training, teaching the subject to respond to the essential stimulus elements is evident. Ogle (1967) demonstrated that the magnitude of fixation disparity remained constant over a long period of time. It must be assumed therefore that any reduction in magnitude has been due to training the subject to control the disparity. This study confirms the results found by Haynes and Gray (1961) in a preliminary study, that there is a reduction in the flash frequency of the intermittent control stimulus over time. The significant reduction in the magnitude of fixation disparity at 40 cm, the transference of the practice effect to the other test distances 20 cm and 4.25 m shown by a significant reduction in the magnitudes of fixation disparity and the significant reduction in magnitude of fixation disparity across the ranges of lenses and prisms shows that it is possible to modify the vergence responses to approach what was considered by Ogle, et al (1967) and Arner, et al (1956) to be graphical characteristics of superior binocular systems. Because of the difficulty classifying the graphs in Types as Ogle did, it was not possible to determine whether certain Types were more amenable to training than were others. The important factor however was the flattening which was found.

Subjects received a total of four hours of training over the four-week period, attending three twenty-minute training sessions per week. Subjects showed individual differences in their response to the training. Three subjects, numbers 5, 17 and 7, met criteria at the sixth, seventh and eighth training sessions repsectively (Appendix E). For the purposes of analyzing the group reduction in flash frequency of the intermittent control stimulus, these subjects were included as having zero flashes for the remainder of the sessions. As training progressed it became apparent that some subjects were not progressing as rapidly as others, for example numbers 8 and 9. Within this group some demonstrated a sharp drop in flash frequency after a few sessions of relatively no improvement, for example numbers 2 and 6. I became aware that subject number 8 experienced no symptoms during the training and also showed little improvement in the rate of flash frequency. Subjects 2, 6 and 9 only showed a sharp drop in the rate of flash frequency once they began to report symptoms of pulling, strain, burning, tearing, etc. during the training sessions. This observation, although difficult to quantify, could be an area for future research and observation during all forms of visual training. If the subject's visual system is unable to respond to the various stimuli it seems that little or no symptoms are experienced.

Subject number 20 experienced great difficulty voluntarily converging. No problem was experienced once a binocular stimulus was introduced. This phenomenon persisted for the duration of the training even though prism ranges were adequate. The prism ranges (Appendix F) had very little influence on his inability to overcome small amounts of prism under fixation disparity conditions. It is interesting to speculate that the peripheral target was not an adequate stimulus for this subject, or that the magnitude of the fixation disparity had little or no correlation to the magnitude of the duction range.

Four of the seven subjects in the study (numbers 1, 2, 4 and 18) who demonstrated eso-disparity manifested greater eso-disparity upon the addition of positive spheres magnitude at 4.25 m. Figures 16a and 16b show the graphs of lateral fixation disparity due to induced lenses at 4.25 m for subjects numbers 2 and 4. The horizontal axis shows spherical lens values in half diopter increments, the vertical axis shows fixation disparity in minutes of arc. As described under procedures for the determination of the curves of fixation disparity, the average magnitude was determined first, followed by the curves due to induced prism and thirdly the curves due to induced lenses. It is not known therefore whether the greater eso-disparity was due to the residual effects of the addition of base-out prism or due to the unstable posture of the binocular system with a consequent greater eso-disparity caused by the degradation of visual acuity and an inward posturing of accommodation. If the effect was caused by base-out prism why was there a further increase in eso-disparity upon addition of increased magnitudes of positive spheres? One solution is that this was caused by the residual eso-disparity caused by the alternation of positive and negative spheres. Figure 16a shows that subject number 2 no longer manifested this pheonomenon six weeks after training. Questions which arise are: (1) are the residual effects of base-out prism and negative spheres no longer effective due to a superior binocular system which is responding to the essential stimulus elements? (2) are these factors of importance or is it in fact due to degradation of visual acuity?

Assuming that the greater eso-posture was caused by degradation of visual acuity and therefore a less stable binocular system, we must consider carefully what could occur in esotropes who are wearing spectacle corrections with greater positive lens values than is required at distance in order to force the accommodative system to relax. What could in fact occur is that accommodation could posture inside the far point due to an indefinite stimulus.

The use of red and green monocular stimulus elements in the training apparatus provided a means of judging the relative accommodative response. The subjects were instructed to keep the monocular elements clear as the lenses and prisms were introduced. Some subjects who manifested exo-disparities had great difficulty converging to base-out prism as long as they had to keep the monocular elements clear. The accommodation system was being used through the accommodation-convergence

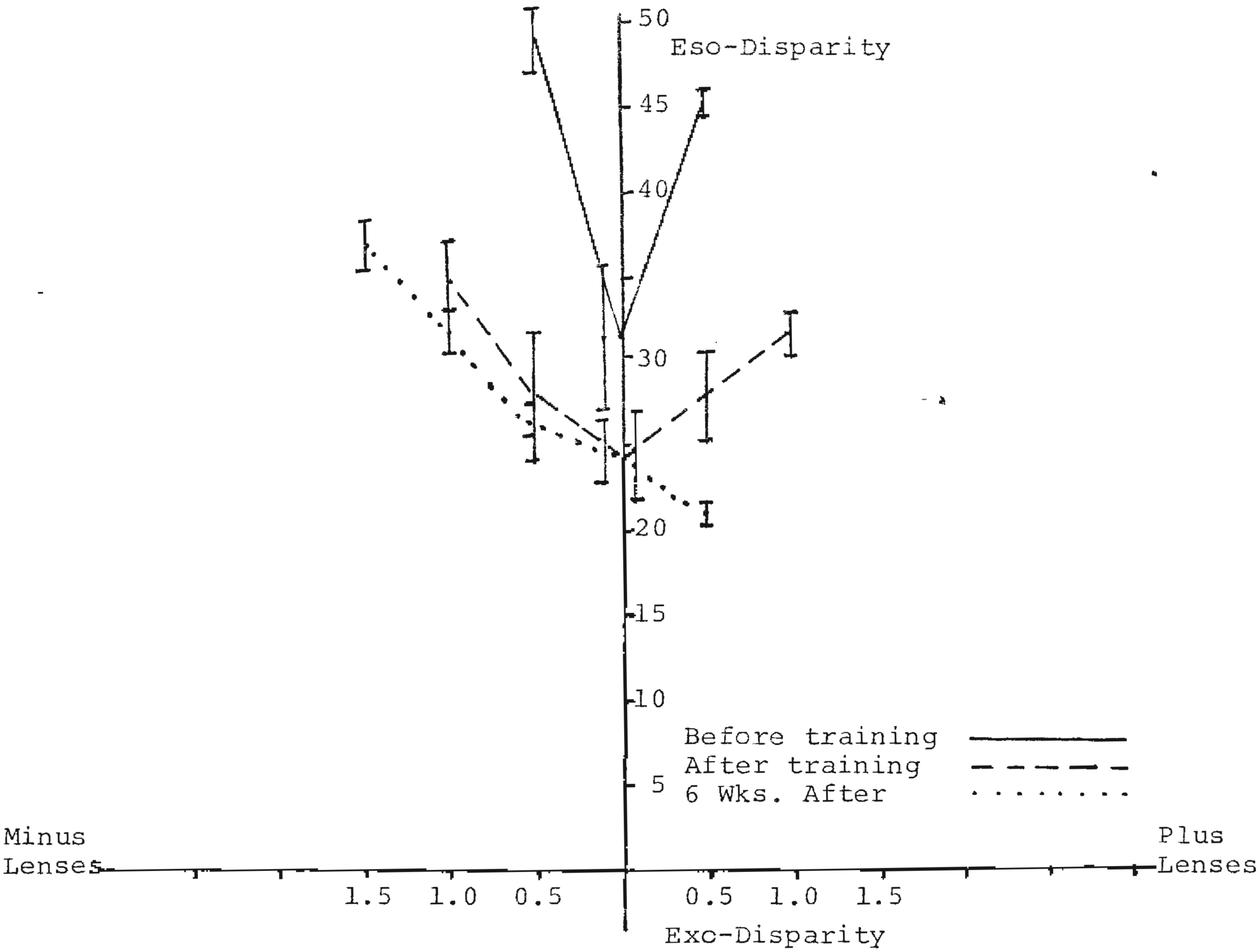


Figure 17 a L.C. No. 2
Lenses at 4.25 m

Graph showing greater eso-disparity with addition of positive spheres at 4.25 m.

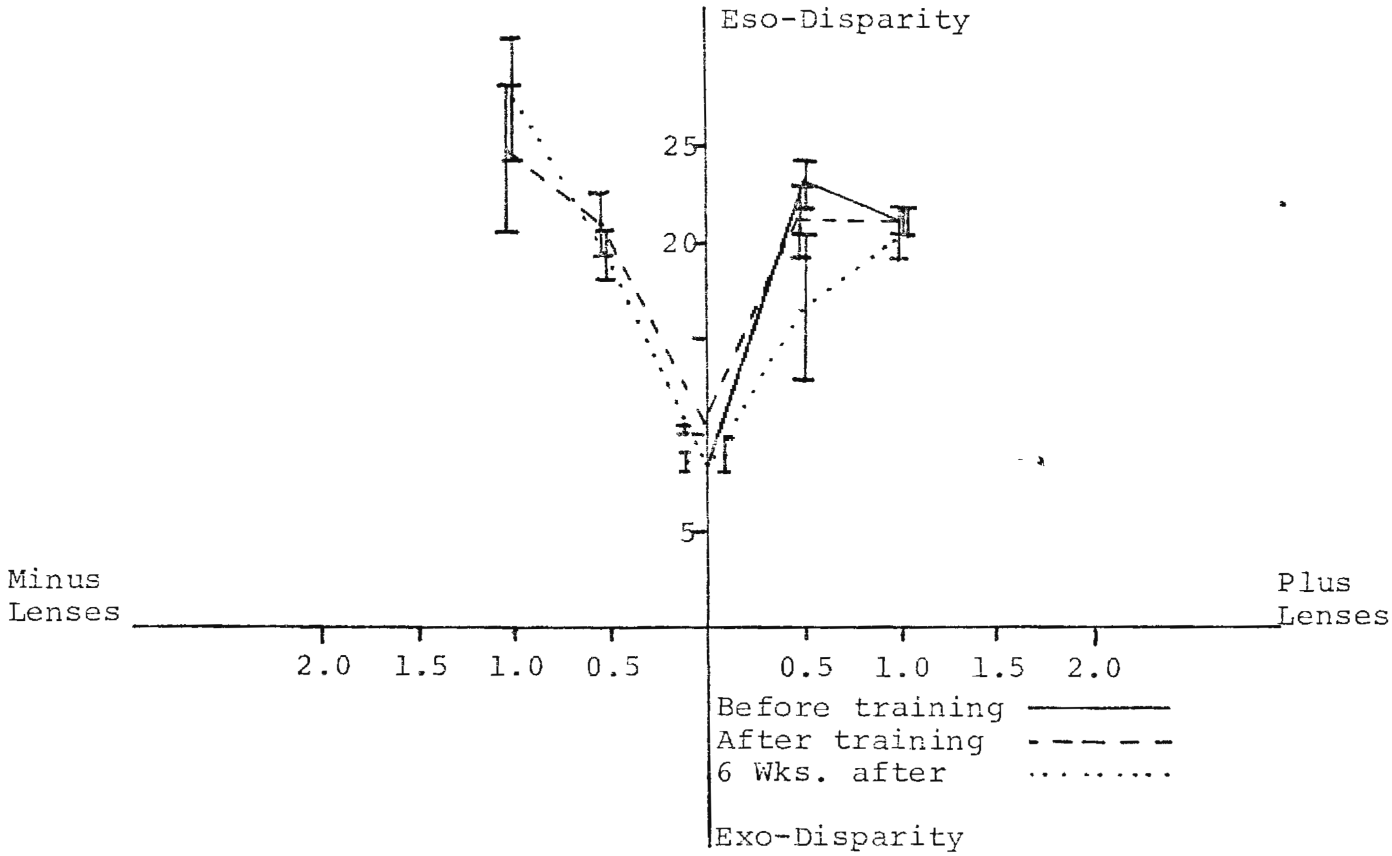


Figure 17 b R.L. No. 4
Lenses at 4.25 m

Graph showing increased eso-disparity with addition of positive spheres at 4.25 m.

relationship to bring about convergence. This was emphasized when positive spheres were introduced. The binocular control did not aid this situation until clarity could be maintained in response to base-out prism. The subject had to learn to converge chiefly using the vergence system.

Not all subjects were ready for this training. In general, if adequate prism and lens ranges were present (determined during the visual examination-see appendix F) a rapid decrease in the flash frequency was evident as well as an ability to control the monocular elements during training. Some subjects, numbers 6 and 8 for example, had difficulty fusing the intermittent control stimulus and training time had to be spent practicing this skill. If prism and lens ranges could have been developed prior to, or concurrent with, the training, it is probable that a larger and faster improvement in flash frequency and hence in their ability to control their fixation disparities, would have been evident.

The Sign Test proved an extremely valuable means for statistically treating the data, although a minor problem arose with its use. In cases where a large reduction in the magnitude of fixation disparity occurred, a corresponding shift in the curves to induced lenses and prisms took place. A good example is subject number 13. Inspection of the curves due to induced base-in prism at 40 cm (Appendices C and D) shows that before training the subject manifested a fixation disparity to 2 prism base-in of 16'47" of arc exo-disparity and after training 1'37" of arc eso-disparity, a more "normal" response. At the 10 prism base-in level the subject has reached zero fixation disparity, or the value of his associated phoria before training. Due to the decrease in the magnitude of the exo-disparity after training, a 9'45" of arc eso-disparity exists at the same level. The Sign Test shows this as an increase in fixation disparity, an erroneous conclusion. This also occurred in subjects who demonstrated larger exo-disparities due to induced base-out prism as the result of a decrease in the magnitude of an eso-disparity (subject number 6). Due to the small number of such occurrences, the success rate of the training procedures and the fact that this did not occur in all cases, they were included in the group tallies.

The results show that once a correct response has been established there is a further improvement and not necessarily regression when training is halted. This is seen in Tables IV, VI, and VII, one week post training--six weeks post training, where there are more subjects showing a further decrease in the magnitude of fixation disparity. In most instances there are no statistically significant differences between the magnitudes of fixation disparity one week after and six weeks after training. This means that there was no decrease in the effectiveness of training. In Table VI there are significant differences for base-in and base-out prism. These are not cases of regression after training however, but examples of further improvement in the responses of the visual system to induced prisms of 40 cm.

The ability of this technique to change the characteristics of the curves of fixation disparity has far-reaching consequences. Ogle, et al (1967), Arner (1956) and others feel that flat slopes and extended ranges are proof of adequate systems. It is theoretically possible then to approach this situation.

The statistically significant decreases in the motor response lag of convergence as measured by lateral fixation disparity serve further to demonstrate that a simple shift in the magnitude of fixation disparity has not occurred. There has been a reduction due to an altered interaction between the components of the visual system in response to the test stimulus. It may be that convergence, like accommodation, requires training where certain skills have not been acquired through normal development. By making the patient more aware of the differential responses to the essential features of the convergence and accommodation stimulus, more precise binocular fixation has been trained.

CHAPTER VII

CONCLUSION

This study has shown that it is possible to train more precise binocular fixation as measured by lateral fixation disparity, where no other forms of visual training are given concurrently. This was shown as a significant change in the magnitude of fixation disparity at 40 cm and by the reduction in the flash frequency of the intermittent control stimulus over time for individual subjects and the sample. It was shown that the practice effect under training conditions will transfer to other distances. This was seen by significant changes in the magnitudes of fixation disparity at 4.25 m and 40 cm. The various patterns of lateral fixation disparity (Ogle, et al, 1967) are subject to this form of training and show significant flattening. This was seen by significant changes in the magnitudes of fixation disparity at 4.25 m and 40 cm due to induced prisms and lenses.

Suggestions for further research

There is no theoretical reason why vertical and cyclorotational fixation disparity should not be trained by the same techniques. Further research is needed with a population having magnitudes of fixation disparity of 5' of arc or greater at both 40 cm and 4.25 m, rather than just at 40 cm. Further research is needed to determine whether there is a significant reduction in patient symptoms following this form of training. Now that it has been demonstrated that fixation disparity is amenable to training in subjects with binocular vision, research is needed to establish to what extent this technique can aid in the establishment of normal binocular vision in strabismics and other less serious vergence malfunctions.

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APPENDIX A

APPENDIX A

Consideration will be given here to the historical development of the techniques used for the examination of, and search for understanding of, the phenomenon of fixation disparity. The references cited bear no direct relationship to the proposed study, but have been included as a review of the literature on fixation disparity.

Hofman and Bielschowsky (1900), as cited by Ogle, et al (1967), using a haploscope presented targets of identical pages of print to each eye (refer to Fig. 18). In the center of each target a horizontal line was drawn. On the target to be seen by the left eye a short narrow vertical line was drawn in the center of the horizontal line. On the right target a millimeter scale was drawn horizontally below the line. With binocular observation of the targets, the images of the print were fused and the vertical line was seen pointed to some scale division. They found that as the arms of the haploscope were moved to alter the convergence of the eyes, the position of the indicator mark relative to the scale changed, in spite of the print appearing single. They called the discrepancy in convergence a "residual disparity". (Fixation disparity).

Lau (1921), also using targets in a haploscope, observed that the monocularly seen portions of the targets appeared displaced horizontally with respect to each other; the magnitude of the displacement varying with the degree to which the convergence of the eyes was forced to change.

Irwin and Sakuma (1924), using the haploscope with card targets (4 and 5 of diamonds), found that although the corner diamonds were fused, the center diamond changed its position with sudden movements of the cards.

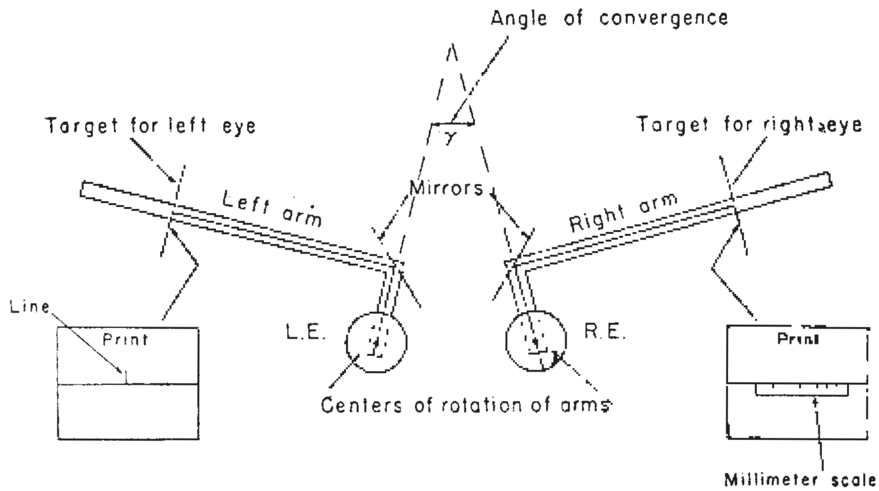


Figure 18. Scheme of haploscope and targets used by Hofmann and Bielschowsky which illustrates phenomenon of fixation disparity (called by them residual disparity). (From Oculomotor Imbalance in Binocular Vision and Fixation Disparity Lea and Febiger 1967.)

Ames and Gliddon (1928) reported on a phenomenon they called "retinal slip". They found that the magnitude of the slip appeared (1) to be somewhat determined by the space that separated the similar from the dissimilar parts of the targets; (2) for any one observer the amount of the slip varies with the amount that his eyes are verged from their normal position; and (3) the magnitude varied with different individuals.

Although no statistical analysis appears to have been carried out on the data obtained from fifty-one subjects, Ames and Gliddon claim a close correlation between the amount of change in vergence necessary to correct the retinal slip and the phoria measured in meter angles. They also described how the horizontal slip could be changed by changing the accommodation of the observer.

Another area of investigation was retinal slip and stereoscopic vision. They found that for an observer who had a phoria for the distance at which the cards were placed, that in some cases the slip was greatly reduced when he appreciated a good stereoscopic effect. If the slip was not reduced, the stereoscopic effect tended to be poor and could be greatly improved by changing the vergence until the slip was eliminated.

Clark (1936), as cited by Carter (1957), reported an experiment in which he took photographs of the eyes as fixation was shifted back and forth between two objects in a fused stereoscope picture. He found fixation disparity magnitudes as great as 2-4 degrees, the object of fixation still being reported single. He stated that any point on the retina within one to one-half degrees from the center of the fovea may be used for fixation.

Morgan (1947), studying the direction of the visual lines when fusion was broken, noticed that as vergence was changed "there was a noticeable lag of the dissimilar parts of the fusion target. On the average when this difference between the two dissimilar targets became 1 cm, diplopia resulted." He said the lag observed was the fixation disparity.

According to Charnwood (1951), when prism is applied the amount of slip increases more and more rapidly until it measures something like the full extent of Panum's area, at this point fusion breaks down. Ogle, et al, as previously stated, worked with a peripheral lock and test detail on a blanked-out central space. Representative subjects of the Type 1 and Type 2 curves were tested with this square varying from $1/2^{o}$ to 6^{o} and found marked changes in the recorded curves, those of the first group becoming steeper as the area free from fusion detail was increased, while the horizontal part of the curve for members of the second group was displaced vertically, the change in slope being confined to the end representing forced convergence where the curves cross approximately at a point.

Charnwood felt that this powering and raising was an even more fundamental difference between the two groups than the difference in the shape of the curves. He felt that this bore out Ames and Gliddon in that varying the size of the area without fusion detail does not alter the forced vergence needed to produce zero slip.

Shepherd (1951) rejected the hypothesis that fixation disparity increased with an increase in target size, i.e., central fusion was decreased. The correlation he obtained for the particular experimental apparatus and procedure was $r = -.26$. This study was prompted by Ogle's reference to this phenomenon.

Steward (1951), as cited by Carter (1957), using a photographic technique, determined the difference between the convergence stimulus and the actual convergence of the eyes, the fixation disparity, for various targets and target distances. Even when he used a cross hair for binocular fixation, convergence fluctuations of over a degree occurred without any awareness of diplopia. He pointed at the discrepancy in the maximum amount of fixation disparity obtained by Ogle's subjective technqiues and his photographic one and advised further experimentation.

Walls (1951) presented his theory of ocular dominance. In this paper he supports Ogle's results that fixation disparity is present in the non-dominant eye in certain individuals. He states that, "fixation disparity is a 'plus or minus tolerance' that allows for the limitations on the ability of the binocular motor coordinating mechanisms to take and hold a setting of the eye muscles with anything like the precision they might have if they were made of metal, instead of living tissues. If, however, the triangular relationship of the two eyeballs and the point of regard is doomed to be this inaccurate, it seems logical to relegate all the inaccuracy to the eye whose variations in posture cannot induce corresponding falsifications of the perceived posture of objects."

Hebbard (1955), as cited by Carter (1957), reported in a personal communication that he had made photographic measurements of the right eye components of fixation disparity with three subjects and that he had found surprisingly large amounts of fixation disparity.

Mitchell and Ellerbrock (1955) investigated the variation of fixation disparity with prolonged stress on the fusional mechanism of the eyes. The purpose of the study was to attempt to answer questions such as "Does fixation disparity change with protracted use of the eyes? Does it vary with the stress on the fusional mechanism due for example, a large phoria?"

Adaptation to forced divergence was found, no such compensation was demonstrated for forced convergence. The curves of forced convergence usually require a longer period for recovery than those of divergence. On these bases, the authors concluded that fusional convergence was mediated by a different mechanism than fusional movement in other directions. The parameter of time was found to play an important part in determining the shape of the curve. Because fixation disparity did not adapt during forced convergence, they suggested that it might be of value in the clinical analysis of the convergent fusional mechanism.

Jampolsky (1956) states that it is possible to diagnose convergent fixation disparity by means of the cover test. This is in direct conflict with Ogle. Jampolsky also states that everyone has a minute amount of "normal fixation disparity". This is due to the fact that physiological nystagmus and Panum's areas make the visual axes, within certain limits, miss exact bifoveal fixation under normal conditions.

According to him, the problem of fixation disparity is primarily concerned with the foveal areas of Panum. Fixation is limited by the size of Panum's area at the edge of the most central (foveal or axial) fusional border. If then the test situation makes it artificially possible for the patient to miss bifoveal fixation, through the absence of fusion detail, a greater amount of fixation disparity may be determined than occurs in nature. This was related primarily to convergent fixation disparity.

Jampolsky, Flom and Freid (1957) investigated the magnitude and direction of fixation disparity as well as trying to determine the type of relationship existing between fixation disparity and horizontal heterophorias. The conditions under which the fixation disparity was measured eliminated the central blanked-out area, in order that an evaluation of the relationship between fixation disparity and horizontal heterophoria could be obtained which would be more nearly that which occurs under normal seeing conditions.

The results they obtained showed that for distance fixation, large values of esophoria are associated with large values of convergent fixation disparity, but that for exophoria there was little or no relationship between the degree of exophoria and the fixation disparity. The best fit parabola showed that the amount of fixation disparity was almost constant over the range of exophoria but that the esophoria showed an increase in fixation disparity with an increase in the magnitude of the esophoria.

For the near fixation distance the relationship between the heterophoria and fixation disparity was the same kind for both esophoria and exophoria. Increasing amounts of heterophoria were associated with increased amounts of fixation disparity.

They noted that the direction of the fixation disparity was always in the same direction as the heterophoria in esophoria, but that cases of exophoria were associated with a convergent fixation disparity. Such "opposite" fixation disparity measurements were usually associated with small amounts of heterophoria. They concluded that they were probably artifacts of instrumentation and technique.

Carter (1958), (1960), (1964), in a series of articles on fixation disparity, discussed (1) the division of fixation disparity between the two eyes, (2) the variation of fixation disparity with forced vergence induced by base-out and base-in prism, and (3) the quantitave changes in fixation disparity and in prism with prolonged wearing of prisms.

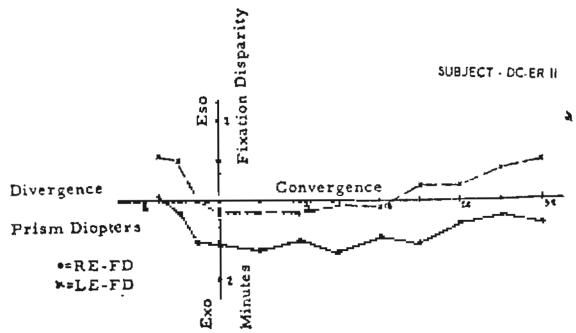
Fixation disparity was measured under two different conditions. In the first condition only the fusion clues were at least 0.75° peripheral from the center of the field. In the second situation, a central vertical line was seen binocularly in addition to the peripheral fusion clues. For the particular test situation it was found that most subjects showed a constant error either to the left or the right. It is this constant error which was used to explain the possible shift seen between the uniocular components of fixation disparity (Fig. 19).

Carter concluded that persons with normal binocular vision subjectively show an equal division of fixation disparity. Those subjects whose experimental results definitely indicated an unequally divided fixation disparity were subjects who had a history of partial suppression of one eye.

With only peripheral fusion, fixation disparity settings of from 10-20 minutes were not uncommon with high forced convergence or divergence. With foveal fusion present fixation disparity rarely exceeded six minutes.

Regarding the shape of the fixation disparity curves he found that many subjects demonstrated a different response type depending on whether or not foveal fusion was present. He divided the curves in four groups. They were identical with regard to fixation disparity response to base-in prism forcing divergence. The difference was in the response during convergence forced by base-out prism.

<u>Group I</u> was characterized by a steady exo shift of fixation disparity with increasing convergence. <u>Group II</u> demonstrated a vergence range with no change in fixation disparity, but having an exo shift near



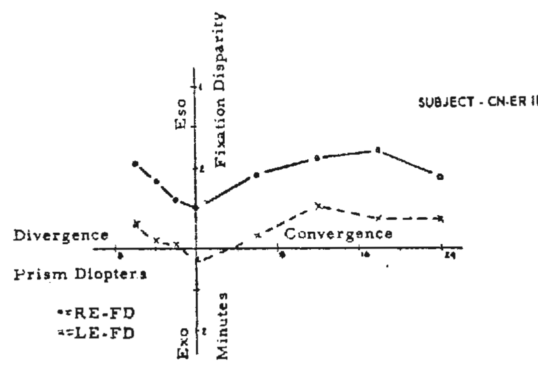


Figure 19. Examples of data of subjects whose curves for the right and left eye components of fixation disparity probably are shifted apart by an uncompensated vernier constant error. (From Amer. J. Optom. and Arch. Amer. Acad. Optom., 35:590-598.)

the base-out prism limit. <u>Group III</u> was characterized by a vergence range with no change in fixation disparity extending up to diplopia from base-out prism. The <u>Group IV</u> response to convergence was, first, on exo trend but as higher base-out prism was employed an eso shift occurred. He concluded that this indicated a high facility at positive fusional convergence.

<u>Pickwell & Stockley</u> (1960) measured fixation disparity objectively by observing images on the subject's fundi. They showed that the image does in fact slip across the retina during the phenomenon of binocular fixation disparity. The amount of slip appeared to be fairly constant for each patient (observed under the same conditions), but depended on the degree of fusion lock. The more central the lock, the smaller the retinal image slip.

<u>Hebbard</u> (1962) compared subjective and objective measurements of fixation disparity. Photographic (objective) measurements were made by placing contact lenses with plane mirrors on both eyes of the subject and reflecting light to an oscillographic camera, by using the optical lever principle. The measurements were based on the following assumptions. (1) That while one eye is occluded, the mean position of the unoccluded eye is the position of zero fixation disparity, (2) that the change in the mean position of the unoccluded eye which occurs during binocular vision as compared to its mean position during monocular vision is a measure of the uniocular component of fixation disparity, (3) the total fixation disparity for the two eyes equals the algebraic sum of the uniocular components.

Since the variation between the results of the two methods of measurement lies within the limits of experimental error, the data support the conclusion that the subjective measure of fixation disparity does indicate the relative mean positions of the eyes.

Hebbard (1964) studied the effect of blur on fixation disparity. Only four subjects were used in the study, but all four showed an increase in fixation disparity when the fusion target was blurred without the use of lenses before the eyes. He suggested that a larger increase in fixation disparity for blur produced by plus lenses may indicate good fusion quality.

Mallet (1964) considers fixation disparity to occur in two forms - "the most common form occurs whenever heterophoria throws a burden upon the individual which the available fusional processes find difficulty in meeting - an uncompensated heterophoria. The fixation disparity in these cases is very small, being limited by the dimensions of Panum's areas at the foveas, i.e., ± 5 minutes of arc. It is therefore much too small to be seen with the cover tests. The disparity will be much the same whether the heterophoria causing it is one or twenty or more prism diopters."

The second type is linked with foveal suppression allowing larger Panum's areas to be used. According to Mallet, it is possible to see this deviation with the cover test.

Ogle (1967) - although Ogle's work has been discussed previously, some interesting comments on fixation disparity will be included here.

"It is apparent from statements found in the clinical literature that the phenomenon of fixation disparity often is not understood. To counteract the misunderstanding, it seems worthwhile finally to clarify some prevalent notions about fixation disparity.

First, and this point must be emphasized, fixation disparity is not a 'small angle squint'. Nor, if found in a patient, does it indicate a latent squint - unless one wishes to accept the idea that any heterophoria is a latent squint.

Fixation disparity <u>cannot</u> be found by the cover test. Not only is this angle too small, but it would be completely masked by the eye movements due to the phoria.

Fixation disparity is <u>not</u> an indication of the lack of foveal binocularity.

Fixation disparity is <u>not</u> an indication of anomalous correspondence.

It is <u>not</u> possible to differentiate between heterophoria and a heterotropia on the basis of whether or not fixation disparity exists.

Fixation disparity is <u>not</u> related to foveal suppression.

Fixation disparity has <u>no</u> effect on stereoscopic depth perception, <u>nor</u> does it have anything to do with aniseikonia.

Fixation disparity will occur only, first, if the subject has some fusion, and second, if there is an oculomotor imbalance or a heterophoria at the test distance."

<u>Woolf</u> (1968) found differences in measures of fixation disparity between college freshmen in the top quartile and those in the bottom quartile on reading achievement. Phoria measures were not different in these good and poor readers.

<u>Kerns</u> (1969) reported on seventeen patients whom he had corrected with prism as indicated by the distance AO vectographic fixation disparity test. Eleven had complete relief from asthenopic symptoms, five partial relief, and one reported no relief.

<u>Martens</u> (1970) reiterates Ogle's ideas on fixation disparity that "it is part of normal binocular vision."

<u>Backman</u> (1972) found a positive correlation existing between the

Sheard-Percival criteria and the fixation disparity elimination results for base-out prism. No significant correlation existed for base-in prism. Fifty-six subjects were studied, the amount of prism used to relieve the fixation disparity was determined by the Mallet box.

Cole and Boisvert (1974) reported on the effect of fixation disparity on stereo-acuity. Under the conditions of the experiment, each subject showed an overall increase in stereo-acuity as fixation disparity was reduced towards zero. The relationship, however, was not a simple linear one.

Due to an assumed proximal effect, all observers showed eso-fixation disparity for all settings of convergence - similar results for exo-disparity therefore, have to be assumed. Unfortunately the convergence ranges of the instrument were limited.

The authors suggest a change in stereothreshold with both base-out prism and base-in prism for a Type I curve, a change in stereothreshold with base-in prism but not with base-out prism for a Type II curve, a change in stereothreshold with base-out prism but not with base-in prism for a Type III curve, and no change in stereothreshold for large base-out prism or base-in prism, but a small change for intermediate values of prism for a Type IV curve. (Curves as described by Ogle). They also suggest changes in stereothreshold with convergence to be different at different fixation distances due to the occurrence of mixed types of pattern fixation disparity curves.

Payne, Grisham and Thomas (1974) provided two sets of lenses to ten patients with asthenopia and fixation disparity at near. The same frame and distance prescription was used, but one set of lenses had the prism required to reduce fixation disparity to zero as determined with the near Mallet unit, the other had no prism. In accordance with the double blind method, neither the patients nor the dispensing experimenter knew which lenses had prism. All patients preferred the lenses with prism.

Larson and Outerbridge (1974) studied fixation disparity under conditions of continuous measurement.

The test duration was limited to 175 seconds. Generally speaking, the time course of the associated phoria was a characteristic of the subject. The authors suggest, therefore, that because of changes found in the magnitude of the fixation disparity, that experimenters and those interested should consider the use of continuous measurement.

Mallet (1974) discusses the genesis of fixation disparity as he sees it.

It has been shown that the binocular response from optimally super-imposed corresponding receptive fields is greater by some 45% than the sum of the monocular responses. As soon as the alignment of the two fields becomes less precise, a marked decline in the response to stimulation is evident.

Normal binocular vision involves the precise superimposition of pairs of receptive fields in order to obtain maximal response and optimum stereopsis. When this precise alignment of the receptive fields occurs in the plane containing the object of regard, fixation is precise and this state of affairs is present in the majority of people in spite of the presence of heterophoria. Generally, the fusional reserve is adequate to neutralize any latent deviation and enable fixation to be exact.

Generally, the compensatory fusional reflexes are adequate to neutralize any latent deviation and enable fixation to be exact. In cases where the fusional reserves are just inadequate to cope with the situation, the eyes will usually deviate in the direction of the heterophoria. There will be a loss of precise fixation. This loss of precise fixation, then, results in a somewhat subnormal degree of binocular vision.

He states that clinical experience over the past fifteen years has shown that patients with uncompensated heterophoria all have fixation disparity and that the absence of fixation disparity demonstrates the adequacy of the fusional reserves to cope with whatever heterophoria may be present.

Haynes (1977) has compiled a list of clinical generalizations on fixation disparity. The following list contains the salient impressions of H.M. Haynes, gained from the literature and with using fractional dissociation targets, polaroid targets and stereotraining targets.

1. If fixation disparity is abnormal in posture habitually, then any spherical lens prescription which is acceptable by other criteria would have a better prognosis if fixation disparity is moved toward normal clinical ranges of measurement.

2. Unstable fixation disparity induced by accommodative dysfunctions may be reduced by prescribing the appropriate spherical glasses.

3. Spherical and/or prismatic lens prescriptions which increase the magnitude or variability of fixation disparity beyond normal limits for a given test should be avoided. This is especially true if the deviation persists after days or weeks of wearing the glasses.

4. It is a favorable indicator for prescribing prisms when acceptable magnitudes of lateral (or vertical) prisms by other criteria reduce or stabilize the variability of fixation disparity. Conversely, when large amplitudes of unstable fixation disparity are shown with a proposed lens prescription, then control of the vergence malfunction by glasses alone appears improbable.

5. When lateral prism is indicated in a given case by other prescription criteria, the prognosis is improved if fixation disparity is rendered normal by these proposed prisms. Similarly, if the magnitude of prisms to normalize fixation disparity measurements equals other criteria then the prescription of prism is indicated.

6. Slopes of fixation disparity behaviors to spheres, prisms and distance are probably equally important clinically to the magnitude of fixation disparity at any one distance. Neutralization techniques for measuring and prescribing are limited by not taking these variables into account.

7. If the amount of lateral prism (or sphere) to produce normal fixation disparity responses is greater than other prescription criteria such as blur point analysis, spherical slope considerations, recovery-phoria computations, etc., then the prognosis for successful control with lenses is improbable or greatly reduced.

8. Identification of the multiple variables in any given case which gives rise to abnormal vergence behavior is necessary for prescribing. No simplistic balancing procedure with spheres or prisms without due considerations to the multiplicity of variables contributing to the dysfunction seems theoretically probable. Much experimental and clinical literature argues against simplistic neutralization techniques. This is not to imply that some cases will not be satisfied with prescriptions developed by using the minimum lens and/or prism to neutralize or control.

9. When the prismatic magnitudes for normalizing fixation disparity at near and at far are in conflict, then the prognosis for successful prism application is markedly reduced.

10. Sufficient experimental and clinical studies which correlate fixation disparity to other prescription criteria have not been performed. Empirically or theoretically, it is not safe to use fixation disparity as the sole determination of spherical or prismatic prescription over basic refractive needs.

Studies have also been made of the accommodation-convergence relationships using fixation disparity. Ogle, et al (1967) derived a relationship between accommodation and convergence from fixation disparity measurements obtained with (1) prisms and (2) with lenses. The derived data are obtained by finding by interpolation for each of the lens powers used, the corresponding prisms that cause the same fixation disparity.

Hebbard (1960) describes five methods for determining prism-lens ratios and mentions that fixation disparity findings give prism-lens ratios varying from 3.3 to 4.3 depending on how the ratios are determined.

APPENDIX B

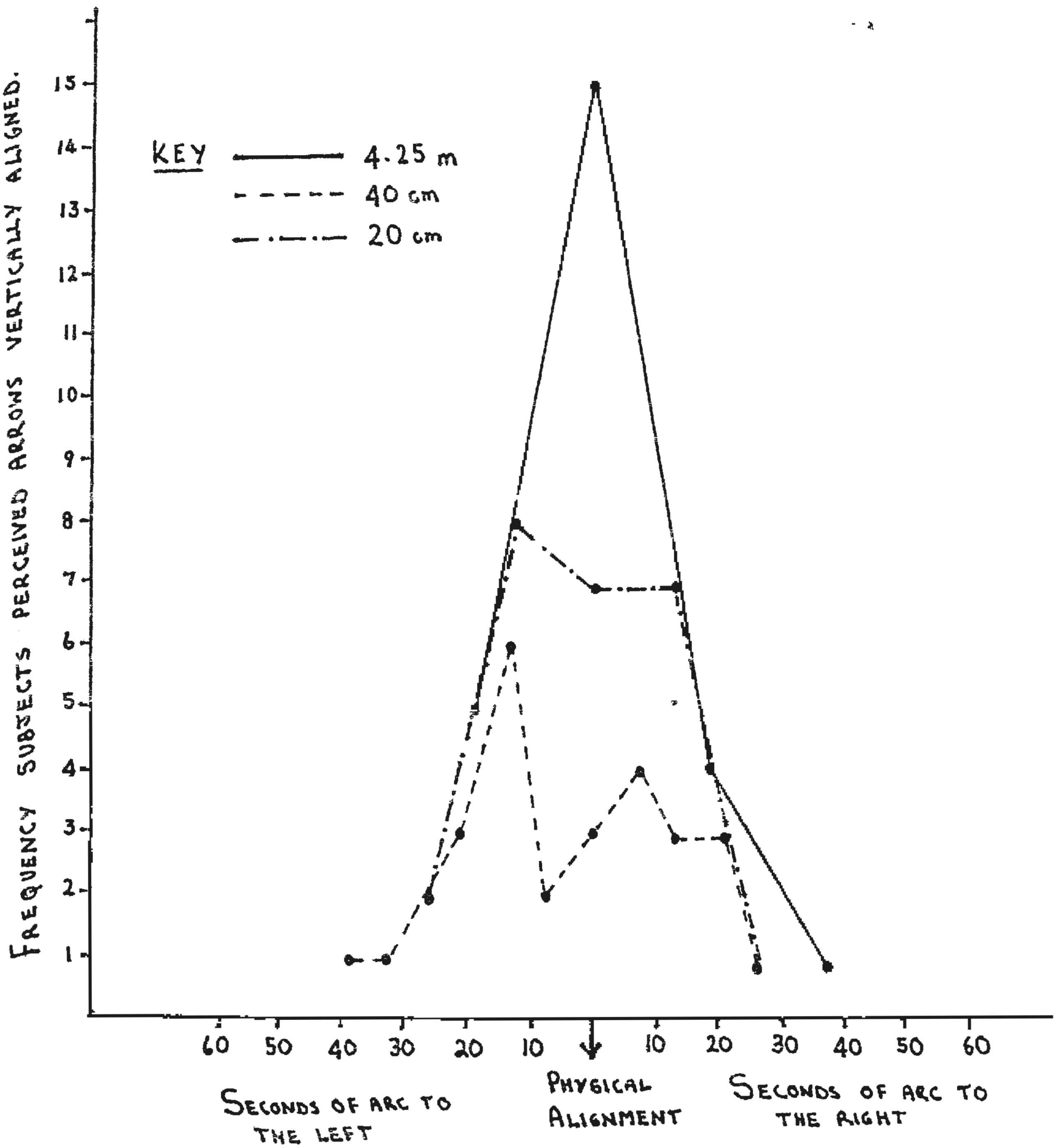
INSTRUMENT RELIABILITY

Procedure The subject viewed the target with the habitual correction in place in the Bausch and Lomb phoropter. Conditions were identical to the testing situation except that the polaroid analysers on the phoropter were removed. The whole target was seen binocularly. The examiner displaced the top arrow to the right-hand side. During flashes the lateral displacement of the arrows was reduced and the subject was asked to report when the arrows first appeared in vertical alignment. The procedure was repeated from the left-hand side. Five pairs of observations were made for five subjects at each of the test distances 4.25m, 40 cm and 20 cm.

Results A graph was plotted for five subjects at each test distance. The vertical axis shows the frequency the subjects reported the arrows as being vertically aligned at each horizontal axis unit. The horizontal scale represents the actual scale readings on the caliper and micrometer depth gauge. Inspection of the graphs shows that the reliability of the instrument readings are within one minute of arc, the accuracy to which readings were made. Any larger variability was assumed due to the instability of the subject's visual system under the testing conditions.

APPENDIX B

INSTRUMENT RELIABILITY



RELIABILITY

4·25 m   1 = 38"; 2 = 1' 16"; 3 = 1' 54"

1.	R	L	2.	R	L	3.	R	L	4.	R	L
A	+2	+1	A	2	0	A	0	0	A	0	0
B	+1	+1	B	1	1	B	0	0	B	1	1
C	+1	+1	C	0	0	C	1	0	C	1	1
D	+1	0	D	0	0	D	1	0	D	1	0
E	+1	+1	E	0	0	E	1	0	E	0	0

5.	R	L
A	1	1
B	0	1
C	1	1
D	1	2
E	0	1

40 cm   1 = 13"; 2 = 26"; 3 = 39"; 4 = 52"; 5 = 1' 5"

1.	R	L	2.	R	L	3.	R	L	4.	R	L
A	3	5	A	3	4	A	5	1	A	4	2
B	3	5	B	+2	3	B	1	3	B	3	0
C	4	1	C	4	3	C	3	3	C	4	1
D	3	5	D	2	5	D	3	2	D	0	1
E	2	4	E	+2	4	E	3	2	E	3	2

5	R	L
A	4	4
B	2	1
C	1	1
D	3	1
E	0	2

20 cm 1 = 26"; 2 = 52"; 3 = (78") 1' 18"; 4 = 1' 44"

1.	R	L
A	2	3
B	1	0
C	1	2
D	0	2
E	2	2

2.	R	L
A	4	3
B	2	1
C	2	2
D	3	1
E	1	2

3.	R	L
A	0	2
B	1	1
C	2	1
D	0	0
E	1	0

4.	R	L
A	1	2
B	1	2
C	1	2
D	2	2
E	1	2

5.	R	L
A	3	2
B	2	2
C	2	1
D	0	1
E	1	1

APPENDIX C

APPENDIX C

EXPLANATION OF SIGN CONVENTION USED

In the columns containing the mean magnitude of fixation disparity the traditional sign convention applies, i.e. + for eso-disparity and - for exo-disparity. For the rest the ± signs have no reference to either exo- or eso-disparity. The position of the upper arrow when perceived by the subject as being vertically aligned with the lower arrow, is conveyed by the ± signs. All measurements were commenced with the arrow on the right side of physical alignment. The horizontal separation of the arrows was clowly reduced.

If (1) the subject perceived the arrows as vertically aligned when the actual position of the arrow was to the RIGHT of physical alignment when approaching from the RIGHT side NO sign was awarded.

(2) the subject perceived the arrows as vertically aligned when the actual position of the arrow was to the LEFT of physical alignment when approaching from the RIGHT side a <u>+ SIGN</u> was awarded (the arrow had crossed over the physical zero point).

Measurements were repeated from the left side of physical alignment. No sign was now awarded if the arrow was to the left of physical alignment and a + sign was awarded if it had crossed to the right side before being perceived as vertically aligned with the lower arrow.

MAGNITUDE OF FIXATION DISPARITY

SUBJECT: D.S.　　　NO: 1

4.25m　　Fxd.　　　　Fxd.'　　　　Fxd."

	Fxd. R	Fxd. L	Fxd.' R	Fxd.' L	Fxd." R	Fxd." L
1	+3'30"	5'4"	+5'47"	5'42"	+7'36"	6'20"
2	+4'78"	7'36"	+4'26"	5'42	+7'36"	7'36"
3	-5'43	8'53'	+4'26"	3'36'	+4'26"	6'20"
4	7'26'	15'12'	+4'36"	5'42"	+5'42"	6'58"
5	+[illegible]'20'	12'8"	+5'34"	6'58"	+5'42"	7'36"
	Ave: 4'41" eso	Ave: 9'22" eso	Ave: 4'49" eso	Ave: 6'18" eso	Ave: 6'12" eso	Ave: 6'58' eso
	Mean: 7'2 eso		Mean: 5'35" eso		Mean: 6'35" eso	

40cm.

	R	L	R	L	R	L
1	+1'5"	3'15"	+1'5"	2'10"	+2'10"	
2	0	2'10"	0	1'5"	+1'5"	
3	+2 10"	2 10'	0	3'15" --	0	
4	+2'10"	3'15"	+1'5"	1'5"	0	
5	+4'20"	5'25"	0	1'5"	+1'5"	
	Ave: 1'57" eso	Ave: 3'15" eso	Ave: 26" eso	Ave: 1'44' eso	Ave: 52" eso	Ave: 2'23" eso
	Mean: 2'36" eso		Mean: 1'5" eso		Mean: 1'38" eso	

20cm.

	R	L	R	L	R	L
1	+15'10'	26'	+2'10"	0	0	1'18"
2	+15'10"	19'30"	+2'10"	0	+52"	2'10'
3	+13	21'40"	+2'10	2'10"	+1'18"	0
4	+10'50	10'50"	+2'10'	2'10"	+3'10"	4'20'
5	+10'50"	4'20" V	+2'10"	0	0	2'10"
	Ave: 13' eso	Ave: 16'28" eso	Ave: 2'10' eso	Ave: 52' eso	Ave: 52" eso	Ave: 2' eso
	Mean: 14'44" eso		Mean: 1'31 eso		Mean: 1'26" eso	

CURVES DUE TO INDUCED PRISM AT 4.25 M

SUBJECT: D. S. NO: 1

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\overline{X}$	R	L	$\overline{X}$	R	L	$\overline{X}$
4	+3'10"	6'20"	+4'45"	+3'10"	4'20"	+3'48"	+3'10"	5'47"	+4'26"
8	+2'38"	7'38"	+5'1"	+2'51"	4'20"	+3'29"	+1'54"	3'48"	+2'51"
12	+2'26"	5'4	+3'45"	+1'16"	3'10"	+[illegible]'13"	+1'54"	3'48	+3'52"
16	+58	3'10"	+1'34"	0	2'32"	+1'11	+38"	1'54	+1'16
20	3'48	0	-1'54	2'32"	0	-1'16"	1'16"	0	-38"
24	5'42"	-1'16"	-3'29"	1'54"	38	-1'16"	1'16"	+38	-57
28	7'24	+3'10"	-5'25"	2'22"	0	-1'16"	3'10"	+1'16"	-2'13"
32	Bl.O	Bl.O		Bl.O	Bl.O		3'10"	+1'16"	-2'13"
36									
40									

Base-In Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\overline{X}$	R	L	$\overline{X}$	R	L	$\overline{X}$
2	+4'26" E.V.	15'50"	+10'8"	+10'8	15'2"	+12'35"	-9'35"	13'50"	+11'43"
4	D	D		D	D		+16'28"	17'24"	+17'16"
6							D	D	
8									
10									
12									
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 4.25 M

SUBJECT: D.S. NO: 1 B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
+0.50	+17'6" N.M. AND	25'20" E.V.	+21'13"	+15'2" V	20'16"	+17'39"	+15'2"	17'6"	+16'4"
+1.00	BL.O	BL.O		BL.O	BL.O		BL.O	BL.O	
+1.50									
+2.00									
+2.50									

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
-0.50	BL.O, AND	N.M., I.D.		N.M.			+11'24" B	16'28" B	+13'55"
-1.00									
-1.50									
-2.00									
-2.50									

CURVES DUE TO INDUCED PRISM AT 40cm

SUBJECT: D.S. NO: 1

B = Blur B1.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
4	1'5"	+1'5"	-1'5	0	+[illegible]	-1'5"	3'15"	0	-1'38"
8	5'35"	+1'5"	-3'15"	4'20"	-2'10"	-3'15"	2'[illegible]	+3'15"	-2'53"
12	10'15"	+8'42"	-22'28"	9'45"	+5'25"	-7'35"	3'15"	+2'40"	-3'43"
16	2'[illegible]	E.V. N.M.	-21'40	9'45"	+7'35"	-8'40"	4'20"	+1'5	-2'40"
20				9'45"	+6'	-8'8"	4'20"	+3'25"	-3'42"
24				N.M.	N.M.		10'50"	+5'35"	-8'8"
28							8'40"	+5'25"	-7'3"
32							V	V	
36									
40									

Base-In Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
2	+2'10"	3'15"	+2'43"	+6'30"	5'25"	+6'3'	+5'25"	5'25"	+5'25
4	+10'50"	16'15"	+13'33"	+15'10"	16'15"	+15'43"	+5'[illegible]	6'3[illegible]"	+5'5[illegible]
6	B and	E.V.		Bl.O	Bl.O		+13'	11'55	+12'27'
8							+6'30"	9'45"	+8'8"
10							+14'5'	10'50'	+12'28'
12							+19'50"	21'45'	+20'55"
14							+18'25"	21'40"	+20'3"
16							+25'30	27'5"	+26'18'
18							+27'5"	32'30"	+29'48"
20							N.M.	N.M.	
22									

CURVES DUE TO INDUCED LENSES AT 40 cm

SUBJECT: D.S. NO: 1

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	I	$\overline{X}$	R	L	$\overline{X}$	R	L	$\overline{X}$
+0.50	+2'10"	4'20"	-3'15"	+2'10"	1'5"	+1'38"	+3'15"	4 20"	+3'48"
+1.00	+1'5"	3'15"	-2'10"	0	0	0	+2'10"	0	+1'5"
+1.50	1'5"	+2'10"	-1'38"	5'25"	+3'15"	-4'24"	3'15"	+2'10"	-2'43"
+2.00	5'25"	+2'10"	-3'48"	5'25"	+4'20"	-4'52"	3'15"	+1'5"	-2'10"
+2.50	BL.O	BL.O		BL.O	BL.O		BL.O	BL.O	

Minus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\overline{X}$	R	L	$\overline{X}$	R	L	$\overline{X}$
-0.50	+8'40"	10'50"	+9'45"	+7'35"	3'15"	+5'25"	BL.O	BL.O	
-1.00	BL.O	BL.O		BL.O	BL.O				
-1.50									
-2.00									
-2.50									

MAGNITUDE OF FIXATION DISPARITY

SUBJECT: L.C. NO: 2

4.25m

	Fxd.		Fxd.'		Fxd."	
	R	L	R	L	R	L
1	+25'20"	31'40"	+20'16"	25'20"	+19"	21'32"
2	+30'24"	36'44"	+17'44"	25'20"	+27'52"	20'54"
3	+30'24"	40'32"	+22'48"	27'52"	+22'48'	30'24"
4	+22'48"	34'12"	+25'20"	31'40"	+25'20"	31'2"
5	+25'20"	34'58"	+22'48"	25'20"	+18'22"	27'52'
	Ave: 26'51" eso	Ave: 35'35" eso	Ave: 21'41" eso	Ave: 27'6" eso	Ave: 22'40' eso	Ave: 26'20" eso
	Mean: 31'13" eso		Mean: 24 26" eso		Mean: 24'30" eso	

40cm.

	R	L	R	L	R	L
1	+27'5"	32'30'	+23'50"	28'40"	+23'50"	24'55'
2	+27'5"	32'30"	+30'20"	26'	+20'35"	21'40"
3	+23'53	28'10'	+21'40'	23'50" -	+21'40"	19'30"
4	+[illegible]	[illegible]	+28'10"	29'15"	+19'30"	19'25"
5	+27'5"	36'50"	+21'40"	22'45"	+20'35"	18'25"
	Ave: 27'57" eso	Ave: 32'56" eso	Ave: 25'8"	Ave: 26' eso	Ave: 21'14" eso	Ave: 20'35" eso
	Mean: 30 6 eso		Mean: 25'33 eso		Mean: 20'55" eso	

20cm.

	R	L	R	L	R	L
1	+32'50	32 30	+4'20'	2'10"	+6'30"	0
2	+41 10' V	41 [illegible]	+2'10'	2'10"	+8'40"	2'10
3	+28'10'	[illegible]	+2'10'	2'10'	+6'30	2'10"
4	+[illegible]'10'	[illegible]	+2'10"	4'10"	+2 10	0
5	+21'40	[illegible]	+2'10'	[illegible]	0	6'30"
	Ave: 30 30 eso	Ave: 35'[illegible] eso	Ave: 2 34 eso	Ave: [illegible] eso	Ave: 4'42 eso	Ave: 2 10' eso
	Mean: 32'45 eso		Mean: 2 [illegible] eso		Mean: 3'23 eso	

CURVES DUE TO INDUCED PRISM AT 4.25M

SUBJECT: L.C. NO: 2

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
4	+22'48	3'24	[illegible]	+20'16	22'48'	+21'32'	+15'2	24'4"	+19'33'
8	+21'22' V	V	+25'56	+10'8'	22'4	+11'28'	+12'[illegible]	24'4'	+18'22'
12	+20'4 V	33'24 V	+27'12	+11'24	13'12	+17'33'	+17'44	22'16"	+19'57"
16	+10'44 V	24 V	+20'52"	8'32	13'54	+11'24	+13'50'	19'	+16'38'
20	+10'4 V	[illegible] V	+12'16	+9'12	14'24	[illegible]	+12'2'	15'50'	+13'56
24	E.V.	E.V.		+6'20	11'	+2'52"	-10'8'	15'2"	+12'56'
28				+5'4	6'20	+5'42'	+4'56"	10'8	+8'52'
32				+1'54'	+35	-1'16"	+4'26'	5'10	+5'48'
36				5'	0	-2'52	0	+6'8'	-5'10"
40				N.M.	N.M.		10'8	+20'16'	-15'12'

Base-In Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
2	ID	ID		+27'52'	32'56"	+30'24"	+25'26'	38'	+31'40"
4				+42'32'	38'	+39'16'	ID	ID	
6				D	D				
8									
10									
12									
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 4.25 M

SUBJECT: L.C.   NO: 2   B = Blur   Bl.O = Blur Out   D = Diplopia   E.V. = Extremely Variable

I.D. = Intermittent Diplopia   J = Numbers jumping in and out of focus

N.M. = Numbers moving   V = Variable

Plus Spheres	Magnitude of Fixation Disparity									Minus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")				Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$		R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
+0.50	+45'36" B	44'20" B	+44'57"	+25'20"	30'24"	+27'52"	+20'16"	21'32"	+20'54"	-0.50	+46'52"	50'40"	+48'46"	+29'4"	31'40"	+27'52"	+25'20"	27'14"	+26'17"
+1.00	Bl.O	Bl.O		+30'24"	32'56"	+31'40"	Bl.O	Bl.O		-1.00	D	D		+32'56"	36'44"	+34'50"	+30'24	32'56'	+31'40"
+1.50				Bl.O						-1.50				D	D		+35'28"	38'	+36'48"
+2.00										-2.00									
+2.50										-2.50									

CURVES DUE TO INDUCED PRISM AT 40cm

SUBJECT: [illegible] NO: 2

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
4	+9'45	10'25'	+14.5	+9'[illegible]	11'55	+10'50'	+5'25'	11'55'	+8'40"
8	+10'50'	19'30'	+1[illegible]'10'	[illegible]	11'55	+11'23	[illegible]	10'51"	+9'45"
12	+[illegible]'25'	15'[illegible]	+[illegible]	+[illegible]'30'	10'50	+6'45'	+8'[illegible]	[illegible]	+7'55"
16	-7'10'	10'50"	-[illegible]'30	+[illegible]'25"	4'[illegible]	+5'17'	0	0	0
20	Bl.O	Bl.O		2'30'	0	-1'5'	0	+1'5'	-32'
24				4'26" V	+5'[illegible]" V	-4'45'	5'25'	-4'20"	-4'53'
28				10'50"	+7'[illegible]	-9'17'	9'45'	+13'	-11'23'
32				?-5? V	+21'[illegible]'	-23'17	14'5'	+16'25'	16'15'
36				Bl.O	Bl.O		Bl.O	Bl.O	
40									

Base-In Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
2	I.D	I.D		+26'	28'10"	+27'5"	+26'[illegible]'	24'[illegible]"	+26'33
4				+42'15'	41'5"	+41'[illegible]'	+32'30'	28'[illegible]'	+[illegible]'26'
6				Bl.O	Bl.O		Bl.O	Bl.O	
8									
10									
12									
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 40 CM

SUBJECT: L.C   NO: 2

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
+0.50	+24'55"	32'30"	+28'42"	+10'50"	8'40"	+9'45"	+17'20"	13'	+15'10"
+1.00	+17'20"	26'	+21'40"	+10'50"	13'	+11'55"	+15'10"	10'50"	+13'
+1.50	+13'	29'15"	+21'8"	+10'50"	10'50"	+10'50"	+13'	8'40"	+10'50"
+2.00	+5'25"	13'	+9'12"	+5'25"	10'50"	+8'8"	+9'45"	5'25"	+7'35"
+2.50	+3'15"	10'50"	+7'2	+2'10"	5'25"	+3'47"	+5'25"	5'25'	+5'25"

Minus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
-0.50	Bl.O	D		+10'50"	21'40"	+16'15"	+16'15"	19'30"	+17'53"
-1.00				Bl.O	Bl.O		+26'	28'10"	+27'5"
-1.50							Bl.O	Bl.O	
-2.00									
-2.50									

MAGNITUDE OF FIXATION DISPARITY

SUBJECT: L.M. **NO:** 3

4.25m

	Fxd. R	Fxd. L	Fxd.' R	Fxd.' L	Fxd." R	Fxd." L
1	+1'16"	1'16'	0	38"	1'16"	38"
2	+38'	2'32'	0	1'54'	+1'16"	0
3	+38'	[illegible]	0	2'32"	0	1'16"
4	+38'	3'48'	0	2'32"	+38"	1'16"
5	0	2'32	0	2'32'	0	1'16"
	Ave: 38"eso	Ave: 2'32"eso	Ave: 0	Ave: 2'2"eso	Ave: 8"eso	Ave: 53'eso
	Mean: 1'35'eso		Mean: 1'1"eso		Mean: 31"eso	

40cm.

	R	L	R	L	R	L
1	9'45'	+3'40"	3'15"	+4'26"	4'20"	+3'15'
2	10'58"	+9'45'	3'15	+2'40'	3'15'	+3'15'
3	10'50	+10'50'	4'20'	+5'15'	1'15'	+2'20'
4	10'57"	+5'25'	4'	[illegible]	3'15'	1'15'
5	10'50"	+5'25"	5'25"	+3'15'	5'25	+1'15"
	Ave: 10'37"exo	Ave: 8'1"exo	Ave: 4'7"exo	Ave: 3'15"exo	Ave: 3'54"exo	Ave: [illegible] exo
	Mean: 9'18"exo		Mean: 5'41"exo		Mean: 3 [illegible]	

20cm.

	R	L	R	L	R	L
1	6'30"	+5'38"	4'20"	+2'10	+2'10	+4'20'
2	6'30	+5'12"	4'20	+2'10'	0	+6'30"
3	6'50"	+4'46	2'10	0	2'10"	+2'10"
4	7'22"	+4'2	4'20	+2'20"	2'2	2'10"
5	6'30'	+2'10'	2'10'		3'30	+2'1'
	Ave: 6'40"exo	Ave: 4'25'exo	Ave: 3'28 exo	Ave: [illegible] exo	Ave: 2'10'exo	Ave: 2'36'exo
	Mean: 5'35'exo		Mean: 2'23'exo		Mean: 2'23'exo	

CURVES DUE TO INDUCED PRISM AT 4.25M

SUBJECT: [illegible] NO: 3

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
4	5'48"	+2'32"	-3'10"	3'48"	-1'1	[illegible]	1'54"	-3'3	-1'16"
8	5'4"	[illegible]	-5'[illegible]	5'4	[illegible]	-4'48"	1'54	+1'	-1'54
12	6'2[illegible]	[illegible]	-5'42"	5'[illegible]	-1'1	-7'[illegible]	2'32"	+2'12"	[illegible]
16	1'[illegible]	[illegible]'54	-1'[illegible]	[illegible]'56	[illegible]	[illegible]+15	1'54	[illegible]	[illegible]
20	1'[illegible]	+1'[illegible] V	-13'32	6'26'	+4'2[illegible]	-5'[illegible]	1'48	+5'4	-1'2[illegible]
24	[illegible]			Bl.O	Bl.O		Bl.O	Bl.O	
28									
32									
36									
40									

Base-In Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
2	+2'32"	5'4	+3'48"	+1'34'	+4'26'	+3'10'	+4'26"	[illegible]	+5'23
4	+13'12	20'16"	+17'4[illegible]	+17'44'	22'48"	+20'16"	+11'24	15'5[illegible]	[illegible]
6	D	D		D	D		+43'4'	34'12"	+38'36
8							D	D	
10									
12									
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 4.25 M

SUBJECT: [illegible]　　　NO: 5

B = Blur　Bl.O = Blur Out　D = Diplopia　E.V. = Extremely Variable

I.D. = Intermittent Diplopia　J = Numbers jumping in and out of focus

N.M. = Numbers moving　V = Variable

Plus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
+0.50	0	1'[illegible]	+[illegible]	0	1[illegible]	[illegible]	+56"	1'[illegible]	+57
+1.00	2'32"	0	-1'[illegible]	0	[illegible]	[illegible]	+[illegible]	[illegible]	[illegible]
+1.50	[illegible]	Blur		0	+2'[illegible]	-1'[illegible]	[illegible]	[illegible]	0
+2.00				Blur	Blur		[illegible]	[illegible]	
+2.50									

Minus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
-0.50	+38"	2'32"	+[illegible]'35"	+1'16"	[illegible]	+1'54"	+2'32"	3'20"	+2'[illegible]
-1.00	+1'54"	3'46"	+2'[illegible]	+1'16"	[illegible]	+3'20"	+2'37"	2'52"	[illegible]
-1.50	+3'[illegible]	4'20"	+4'7'	+3'20'	5'4	+4'7'	+3'20'	2'[illegible]	+2'51
-2.00	+5'4"	6'20"	+5'42"	+3'10"	5'4	+4'7"	+3'20'	3'30'	+5'20"
-2.50	Blur	Blur		+3'10"	5'47"	+4'26	+5'40'	5'4'	+5'4

CURVES DUE TO INDUCED PRISM AT 40cm

SUBJECT: C.M. NO: [illegible]

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	X	R	L	$\bar{X}$
4	15'10"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5'25'	+4 [illegible]	-4'53'
8	[illegible]	+[illegible]50'	[illegible]	8'40"	-8	-3'45"	[illegible]	+6'[illegible]	-5'50
12	[illegible]	[illegible]	[illegible]	[illegible]	+8'[illegible]	-9 [illegible]	7'35'	+8'4	-8'8'
16	[illegible]	+14	[illegible]	11'35'	+7 [illegible]	-9 15'	[illegible]	[illegible]	-9'11
20	[illegible]	[illegible]	[illegible]	[illegible]	+9' [illegible]	-11 [illegible]	[illegible]	[illegible]	-8'8"
24	[illegible]	[illegible]	[illegible] E.V.	15'	+9'4[illegible]	-11 29	5'	[illegible]	-9'15
28	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	
32									
36									
40									

Base-In Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
2	4'20'	+2'1[illegible]	-1'[illegible]	1'5'	2 [illegible]	+33'	2'3[illegible]	+1'5'	-1 [illegible]
4	2'10"	0	-1'5"	0	2'10'	+1'5"	0	0	0
6	0	5'25	+2'4[illegible]	0	5'15"	+[illegible]	+2 10"	0	+1 5'
8	+2'10"	6'25"	+[illegible]	+1 5"	[illegible]	+2'48'	+3'10'	2 10'	+2 10"
10	+5'25"	+[illegible]	[illegible]	+4 20	5'25"	+4 [illegible]	+5'25"	5'25	+5'25'
12	+9'45"	11'55"	+10'50	+5'25'	6'30"	+5'57	+6'[illegible]	6'30'	+6'[illegible]
14	Blo	Blo		+4'20'	9'45"	+7'2'	+6'30'	8'45'	+7'35'
16				+7'55	9'45"	+[illegible]'40	+10'50"	14'5"	+12'28"
18				Blo	Blo		Blo	Blo	
20									
22									

CURVES DUE TO INDUCED LENSES AT 40 cm

SUBJECT: L. M.   NO: 2

B = Blur   Bl.O = Blur Out   D = Diplopia   E.V. = Extremely Variable

I.D. = Intermittent Diplopia   J = Numbers jumping in and out of focus

N.M. = Numbers moving   V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
+0.50	9 [illegible]	+4'[illegible]	-7'[illegible]	5'25"	+3'15"	-[illegible]	2'10"	+5'15"	-2'45"
+1.00	10'50"	-[illegible]	+8'8	5'25	+2'25	-5'25"	5'25"	+6'[illegible]	-5'58"
+1.50	3'45	+3'25"	[illegible]	[illegible]	[illegible]	-4'5[illegible]	[illegible] 50"	+5'25	-5'55"
+2.00	10'50"	+5'45"	-7'[illegible]	6'45"	+6'30	-7'55"	4'20"	+2'[illegible]	-3'15"
+2.50	8'40"	+7'15	-5'50	9'45"	+7'35	-7'40"	7'35	+6'45	-1'8"
	[illegible]	[illegible]							

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
-0.50	-4'20"	0	-2'10"	0	1'5"	+33"	1'5"	0	-33"
-1.00	-1'15"	2'10"	-33"	0	1'5"	+33"	0	0	0
-1.50	BlO	BlO		+1'45"	+10"	+1'55	+2'40	2'[illegible]	[illegible]
-2.00				+2'10"	±15"	+2'43"	+4'20"	4'20	+4'20
-2.50				+2'10"	4'20"	+3'15"	+5'25"	5'25"	+5'25"

MAGNITUDE OF FIXATION DISPARITY

SUBJECT: R.L. NO: 4

4.25m

	Fxd. R	Fxd. L	Fxd.' R	Fxd.' L	Fxd." R	Fxd." L
1	+7'36"	8'52"	+10'8"	10'46"	+8'14"	10'8"
2	+7'36"	9'44"	+10'8"	9'30"	+7'36"	7'36"
3	+6'58"	8'52"	+7'36"	9'30"	+10'8"	7'36"
4	+10'8"	10'46"	+15'12"	12'40"	+8'52"	6'20"
5	+7'36"	10'46"	+7'36"	9'30"	+10'8"	7'36"
	Ave: 7'59" eso	Ave: 9'45" eso	Ave: 10'8" eso	Ave: 10'23" eso	Ave: 9' eso	Ave: 7'51" eso
	Mean: 8'52" eso		Mean: 10'15" eso		Mean: 8'26" eso	

40cm.

	R	L	R	L	R	L
1	2'10"	+2'10"	0	+2'10"	1'5"	+2'10
2	1'5"	+2'10"	0	0	+2'10"	0
3	0	+2'10"	0	0	0	0
4	0	[illegible]	0	0	+1'5"	+1'5"
5	1'5"	+1'5"	0	0	0	0
	Ave: 52" exo	Ave: 1'54" exo	Ave: 0	Ave: 24" exo	Ave: 26" eso	Ave: 39" exo
	Mean: [illegible]		Mean: 12" exo		Mean: 7" exo	

20cm.

	R	L	R	L	R	L
1	10'50"	[illegible]	2'10"	+10'50"	2'10"	+3'2"
2	21'40"	+17'24"	8'40"	+8'40"	2'10"	+6'30"
3	26'	+21'40"	8'40"	+8'40"	6'30"	+2'10"
4	19'30"	+17'20	8'40"	+8'40	2	+2'10"
5	19'30"	+10'50"	10'50"	+8'40"	4'20"	+4'20"
	Ave: 19'30"	Ave: 16'2" exo	Ave: 7'48" exo	Ave: 36" exo	Ave: 3'28" exo	Ave: [illegible] exo
	Mean: 17'46" exo		Mean: 8'27" exo		Mean: 3'20" exo	

CURVES DUE TO INDUCED PRISM AT 4.25M

SUBJECT: R   NO: 4

B = Blur   Bl.O = Blur Out   D = Diplopia   E.V. = Extremely Variable

I.D. = Intermittent Diplopia   J = Numbers jumping in and out of focus

N.M. = Numbers moving   V = Variable

Base-Out Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\overline{X}$	R	L	X	R	L	$\overline{X}$
4	+3'10"	5'4	+4'2'	+6'20"	8'1	+7'17'	+5'4"	6'58"	+6'1"
8	+1'[illegible]	[illegible]	+1'5	+3'[illegible]	5'[illegible]	[illegible]	0	5'10"	+1'15"
12	[illegible]	[illegible]	[illegible]	+3'10"	3'4	+[illegible]'29"	0	0	0
16	[illegible]	[illegible]	-1'[illegible]	-15	+1'[illegible]	[illegible]7"	1'16'	0	-30
20	[illegible]	[illegible]	[illegible]	1'[illegible]	0	-33	1'54"	33	-5[illegible]
24	[illegible]	[illegible]	[illegible]	2'22"	-1'59	-2'15"	3'48"	+1'1[illegible]	-2'34"
28	B.O.	B.O.		[illegible]	+4	-5'23'	B.O.	B.O.	
32				B.O.	B.O.				
36									
40									

Base-In Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\overline{X}$	R	L	$\overline{X}$	R	L	$\overline{X}$
2	+19'	23'48"	+20'59	+21'16'	17'10'	+19'16'	+20'[illegible]	15'28"	+[illegible]'28"
4	+31'40"	38'	+34'50'	+27'52"	38"	+32'56	+40'32"	31'48"	+36'[illegible]
6	D	D		+4[illegible]'32"	>50'40"*	+45'16	I.D.	I.D.	
8									
10									
12					*off the scale				
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 4.25M.

SUBJECT: [illegible] NO: 4

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\overline{X}$	1 Week After Training (Fxd') R	L	$\overline{X}$	6 Weeks After Training (Fxd") R	L	$\overline{X}$
+0.50	+21'58"	[illegible]	+22'[illegible]	+19'	[illegible]	[illegible]	+20'14"	[illegible]	[illegible]
+1.00	[illegible]	[illegible] V	[illegible]	+26'10"	21'3[illegible]	[illegible]	+22'[illegible]	19'	[illegible]
+1.50	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	
+2.00									
+2.50									

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\overline{X}$	1 Week After Training (Fxd') R	L	$\overline{X}$	6 Weeks After Training (Fxd") R	L	$\overline{X}$
-0.50	[illegible]	[illegible]		+1[illegible]'	[illegible]	+25'35'	+17'14'	[illegible]	+19'
-1.00				+[illegible]'10'	27'32"	+24'4"	+30'24"	24'4'	+27'44"
-1.50				[illegible]	[illegible]		[illegible]	[illegible]	
-2.00									
-2.50									

CURVES DUE TO INDUCED PRISM AT 40 cm

SUBJECT: F. NO: 4

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\overline{X}$	1 Week After Training (Fxd') R	L	$\overline{X}$	6 Weeks After Training (Fxd") R	L	$\overline{X}$
4	[illegible]	[illegible]	[illegible]	0	0	0	0	+15'	[illegible]
8	[illegible]	[illegible]	[illegible]	4 20'	+2'[illegible]	-3 15'	5'25'	[illegible]	-2'45'
12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2'[illegible]	-5'40'
16	10'50'	+7 55'	-9 12'	8'00'	[illegible]	[illegible]	[illegible]	+4'[illegible]	-5'25'
20	[illegible]	[illegible]	[illegible]	12	-10'30'	-11 55'	3'45'	+5'25'	[illegible]
24	21'[illegible]	+10'[illegible]	[illegible]	16 5'	+1'	14'30'	10'50	[illegible]	-9'45'
28	[illegible]	Blur		17 6'	+14 5'	-15'42'	15	+8'[illegible]	-10'50'
32				[illegible]	[illegible]		Blur	Blur	
36									
40									

Base-In Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\overline{X}$	1 Week After Training (Fxd') R	L	$\overline{X}$	6 Weeks After Training (Fxd") R	L	$\overline{X}$
2	+1'5'	3'15"	+2'10"	+3'15'	4 20"	+3'47"	+1'5'	2'10'	+1 58
4	+4 20'	[illegible]	+5'57"	+5'25'	4'20'	+4'53	-2'10'	2'10'	+2'10'
6	+6'[illegible]	7'5[illegible]	[illegible]	+7'35'	6'30'	+7'2'	+4'[illegible]	5'45	+4'55"
8	+7'35'	9'45'	+8'40	+10'50'	11'55"	+11 15'	[illegible]	8'40'	+6'8'
10	+12'25'	[illegible]	+21'[illegible]	+10'45"	13'	+11.30'	-14 [illegible]	16'10'	[illegible]
12	Blur	Blur		[illegible]	Blur		Blur	Blur	
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 40cm

SUBJECT: R.L. NO: 4

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
+0.50	1'5"	+2'0"	[illegible]	1'5"	-2'	[illegible]	+1'5"	+1'5"	D
+1.00	[illegible]	-7'30"	-5'25"	1'5"	[illegible]	[illegible]	+1'5"	+2'20"	-3'5"
+1.50	[illegible]	1'5"	-2'42"	2'15"	+2'0"	[illegible]	2'10"	[illegible]	[illegible]
+2.00	[illegible]	[illegible]	[illegible]	1'25"	[illegible]	[illegible]	3'15"	+2'10"	-2'45"
+2.50	[illegible]	[illegible]	-9'45"	[illegible]	+6'45"	[illegible]	[illegible]	+2'30"	[illegible]

Minus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
-0.50	0	3'15"	+1'38"	+2'40"	3'15"	+2'42"	+3'15"	0	+1'38"
-1.00	+3'15"	3'15"	+3'15"	+3'25"	4'25"	+3'45"	+4'20"	1'5"	+2'43"
-1.50	+4'30"	3'15"	+3'47"	+5'45"	[illegible]	+5'5"	+3'25"	4'20"	[illegible]
-2.00	Bl.O	Bl.O		+9'45"	9'45"	+9'45"	Bl.O	Bl.O	
-2.50				+10'15"	10'15"	+10'15"			

MAGNITUDE OF FIXATION DISPARITY

SUBJECT: S.S. **NO:** 5

4.25m

	Fxd. R	Fxd. L	Fxd.' R	Fxd.' L	Fxd." R	Fxd." L
1	6'26"	[illegible]	1'54"	+1'16"	0	0
2	7'36"	+5'48"	[illegible]	+1'16"	0	38"
3	[illegible]	[illegible]	2'[illegible]	-1'04"	+38"	38"
4	[illegible]	[illegible]	2'34"	-1'16"	0	38"
5	9'52"	+2'42"	1'16"	+1'16"	+38"	0
	Ave: 7'6" exo	Ave: 4'26" exo	Ave: 2'9" exo	Ave: 1'24" exo	Ave: 15" eso	Ave: 23" eso
	Mean: 5'46" exo		Mean: 1'47" exo		Mean: 19" eso	

40cm.

	R	L	R	L	R	L
1	10'50"	+5'25"	2'10"	+4'20"	5'25"	-3'15"
2	10'50"	-3'40"	2'36"	+4'20"	5'25"	+7'35"
3	14'[illegible]	+7'[illegible]	2'10"	+6'30"	5'25"	[illegible]
4	[illegible]	+6'50"	3'15"	-5'25"	[illegible]	+5'[illegible]
5	10'50"	+3'40"	2'10"	+6'30"	5'25"	+6'30"
	Ave: 12'8" exo	Ave: 3'48" exo	Ave: 2'28" exo	Ave: 5'25" exo	Ave: 5'12" exo	Ave: 5'51" exo
	Mean: [illegible] exo		Mean: [illegible]		Mean: 5'42" exo	

20cm.

	R	L	R	L	R	L
1					0	0
2	UNABLE TO RESOLVE WITH HABITUAL		UNABLE TO RESOLVE WITH HABITUAL Rx		+2'10"	2'10"
3					+4'20"	4'20"
4					+4'[illegible]	4'20"
5					+4'[illegible]	0
	Ave:	Ave:	Ave:	Ave:	Ave: 3'2" eso	Ave: 2'10" eso
	Mean:		Mean:		Mean: [illegible]	

CURVES DUE TO INDUCED PRISM AT 4.25M

SUBJECT: 5　　NO: 5

B = Blur　Bl.O = Blur Out　D = Diplopia　E.V. = Extremely Variable

I.D. = Intermittent Diplopia　J = Numbers jumping in and out of focus

N.M. = Numbers moving　V = Variable

Base-Out Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\overline{X}$	1 Week After Training (Fxd') R	L	$\overline{X}$	6 Weeks After Training (Fxd") R	L	$\overline{X}$
4	8'52'	[illegible]	[illegible]	5 +	[illegible]	[illegible]	3'48'	-1'	-2'32"
8	[illegible]	[illegible] V	-27'[illegible]	[illegible]	+5 +	[illegible]	[illegible]	[illegible]	-6'56"
12	-	D		17 [illegible]	[illegible]	[illegible]	5'16'	[illegible]	-18'7"
16				17 [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
20				[illegible]	[illegible]	[illegible]			
24				[illegible]					
28									
32									
36									
40									

Base-In Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\overline{X}$	1 Week After Training (Fxd') R	L	$\overline{X}$	6 Weeks After Training (Fxd") R	L	$\overline{X}$
2	3'48"	0	[illegible]	1'10'	0	-38"	+1'10"	[illegible]	[illegible]
4	+3'48"	6'25"	+5'[illegible]	38	2'32'	+1	12'52"	[illegible]	[illegible]
6	+22'26' V	35'22'	+29'[illegible]	[illegible]	27'6"	[illegible]	[illegible]	7'22"	[illegible]
8	± D	± D		D	D		+4'26	[illegible]	+6'1
10							D	D	
12									
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 4.25M

SUBJECT: [illegible]   NO: 5   B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
+0.50	10'8"	+1'10	-5'42'	38	+38	-38	1'10	0	-38"
+1.00	BO	BO		BO	BO		BO	BO	
+1.50									
+2.00									
+2.50									

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
-0.50	2'32"	38"	-57"	+38"	-1'	+57"	D	38	+19"
-1.00	38"	1'16"	+19"	+1'16"	16'	+1'16"	+38"	38"	+38"
-1.50	1'34"	1'54	+19"	+1'16"	1'54"	+1'35"	+38"	38"	+38"
-2.00	J	J		+7'12"	1'16"	+1'54"	BlO	BlO	
-2.50				J	J				

CURVES DUE TO INDUCED PRISM AT 40 CM

SUBJECT: S. NO: 5

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
4	16'15"	+14'5"	+15'[illegible]	10'50"	+15'	-[illegible]	10'50"	11'55"	-11'25"
8	28'10"	+21'45"	24'[illegible]	[illegible]	+21	-[illegible]'47'	[illegible]'42'	+12'25"	-24'2'
12	?D	?D		[illegible]	[illegible]		11'40	[illegible]	-21'[illegible]
16							D		
20									
24									
28									
32									
36									
40									

Base-In Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
2	4'20" V	0	-2'10	4'20"	+4'20"	-[illegible]'20"	2'10"	+2'10'	-2'10
4	0	2'10'	+1'5'	3'15'	-1'5'	-2'20'	2'10'	0	-1'5
6	0	2'20"	+1'5"	0	+15"	-33'	1'5'	2'10'	+33"
8	+5'15'	3'15'	+3'15"	+2'10"	2'10'	+2'10"	0	2'10'	+15"
10	+2'10"	4'20	+3'15'	6'30"	5'25"	+5'57'	+1'5'	3'15'	+[illegible]"
12	+7'35"	11'55'	+9'45'	[illegible]'30'	5'25	+5'57'	[illegible]'25"	4'20'	+4'53'
14	+11'55'	17'[illegible]	+14'[illegible]	+6'30"	5'25	+5'57"	+4'20'	6'30	+5'25'
16	D	D		+13'	14'5"	+13'52"	+[illegible]'30'	[illegible]'55	+2'[illegible]"
18				D	D		+10'5	10'50'	+13'27
20							D	D	
22									

CURVES DUE TO INDUCED LENSES AT 40cm

SUBJECT: [illegible] NO: [illegible]

B = Blur B1.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	I	$\bar{X}$	R	L	X	R	L	$\bar{X}$
+0.50	14'5" ✓	+14'5"	-10'46"	[illegible]	[illegible]	+5'57	6'30	+6'30	-6'30"
+1.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		9'45"	-11'"	-10'52
+1.50	[illegible]	[illegible]					17'53	[illegible]	-8'57
+2.00							[illegible]	[illegible]	[illegible]
+2.50							[illegible]	[illegible]	

Minus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
-0.50	9'45	+5'25	[illegible]	[illegible]	+5'35"	-2'42"	2'15"	1'5	-33"
-1.00	1'5"	2'10'	[illegible]		[illegible]	-1'28"	0	[illegible]	+33
-1.50	[illegible]	[illegible]		[illegible]	1'40'	+1'28"	+5'15"	5'25	[illegible]
-2.00				[illegible]	2'10"	+2'42	[illegible]	5'35"	+5'32
-2.50				+5'25'	2'20'	+4'55"	+10'32"	10'32"	+10'30"

MAGNITUDE OF FIXATION DISPARITY

SUBJECT: J.N. NO: 6

4.25m

	Fxd.		Fxd.'		Fxd."	
	R	L	R	L	R	L
1	+1'16"	3'48"	+38"	3'10"	+1'54"	3'10"
2	+3'48	6'20"	+3'48"	5'4"	+2'32"	3'48"
3	+3'10"	5'4"	+3'48"	4'26"	+5'4"	3'48"
4	+3'48"	6'20'	+3'10'	3'10"	+3'10'	4'26"
5	+4'26'	4'26'	+3'10"	5'4"	+5'4"	3'48"
	Ave: 3'18'eso	Ave: 5'12"eso	Ave: 2'55"eso	Ave: 4'11"eso	Ave: 3'59 eso	Ave: 3'48"eso
	Mean: 4'16"eso		Mean: 3'33"eso		Mean: 3'54'eso	

40cm.

	R	L	R	L	R	L
1	+14'5"	16'15'	+10'50"	13'	+9'45'	10'50"
2	+10'50'	10'50"	+13'	10'50"	+10'50"	11'55"
3	+11'55"	14'5'	+14'5	10'50"—	+8'40"	9'45"
4	+10'50'	9'45"	+9'45"	11'55"	+11'55"	8'40'
5	+8'40'	8'40"	+10'50"	10'50"	+9'45"	10'50"
	Ave: 11'16"eso	Ave: 11'56"eso	Ave: 11'42"eso	Ave: 11'19"eso	Ave: 10'11"eso	Ave: 10'24"eso
	Mean: 11'[illegible] eso		Mean: 11'31" eso		Mean: 10'18"eso	

20cm.

	R	L	R	L	R	L
1	+13'	13'	+4'20'	6'30"	+10'50"	6'30"
2	+6'30"	8'40'	+2'10'	4'20"	+6'30"	0
3	+6'30"	4'20"	+6'30"	2'10"	+4'20"	4'20"
4	+3'2"	8'40"	+4'20'	4'20"	+6'20'	2'10'
5	+3'54"	3'28"	+2'10'	4'20	+4'20	2'10"
	Ave: 6'35"eso	Ave: 7'38"eso	Ave: 3'54 eso	Ave: 4'20"eso	Ave: 6'30"eso	Ave: 3'2"eso
	Mean: 7'7"eso		Mean: 4'7"eso		Mean: 4'46"eso	

CURVES DUE TO INDUCED PRISM AT 4.25 M

SUBJECT: [illegible] NO: 6

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\overline{X}$	1 Week After Training (Fxd') R	L	$\overline{X}$	6 Weeks After Training (Fxd") R	L	$\overline{X}$
4	+1'[illegible]	[illegible]	+2'[illegible]	+30"	1'24	+1'16	+2'32"	[illegible]	+3'29"
8	0	4'[illegible]	+2'[illegible]	+36"	[illegible]	+1'16"	[illegible]	2'[illegible]	+1'54"
12	0	4'[illegible]	+2'[illegible]	0	[illegible]	1'16	+36"	2'12"	+1'35"
16	0	4'[illegible]	+2'24	0	[illegible]	+58"	+36"	[illegible]	+1'10"
20	B.O	B.O		0	2'[illegible]	+1'16"	0	2'24"	+1'12"
24				B.O	B.O		B.O	B.O	
28									
32									
36									
40									

Base-In Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\overline{X}$	1 Week After Training (Fxd') R	L	$\overline{X}$	6 Weeks After Training (Fxd") R	L	$\overline{X}$
2	+5'42"	7'36"	+6'39"	+5'4"	8'14"	+6'39	+1'[illegible]	[illegible]	+12'[illegible]
4	+9'30"	13'18"	+11'24"	+9'30"	10'8"	+9'49"	+1[illegible]'6"	16'[illegible]	+1[illegible]'[illegible]
6	+21'[illegible]" V	24'4"	+22'50"	+1[illegible]'4[illegible]	22'48"	+20'16	+20'16"	[illegible]	+22'4[illegible]
8	D	D		D	D		D	D	
10									
12									
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT [illegible]

SUBJECT: J. N.   NO: 6

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
+0.50	Bl.O	Bl.O		Bl.O	Bl.O		Bl.O	B	
+1.00									
+1.50									
+2.00									
+2.50									

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
-0.50	D	D		+7' [illegible]	+10' 8"	+8' 52"	+11' 24"	+14' 34"	+12' 59"
-1.00				+20' 16"	21' [illegible]	+20' 54"	+20' [illegible]	26' 36"	+2[illegible]
-1.50				J	J		Bl.O	Bl.O	
-2.00									
-2.50									

CURVES DUE TO INDUCED PRISM AT 40 cm

SUBJECT: [illegible] NO: 6

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
4	+4'	[illegible]	+3'46'	[illegible]	5'25'	[illegible]	+3'15'	[illegible]	+3'45'
8	+1'5"	2'1"	+1'38'	2'10"	3'15	+2'38	+2'30	1'5'	+1'38'
12	[illegible]	[illegible]	[illegible]	0	2'5	+1'5	+5'15	[illegible]	+2'43"
16	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-3'15'	[illegible]	+2'43'
20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-1'5'
24	Bl.O	Bl.O		3'15'	+2'[illegible]	+2'38	Bl.O	Bl.O	
28				Bl.O					
32									
36									
40									

Base-In Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
2	+10'50"	7'35'	+9'10'	9'45'	10'50'	+10'18'	+13'	10'50'	+11'55'
4	+13'	17'21	+15'10'	+16'15'	17'20'	+16'48'	+14'5"	16'15'	+15'10'
6	+15'10'	17'20'	+16'45'	+19'30'	18'25'	+18'58"	+21'[illegible]	18'25"	+20'5'
8	Bl.O	Bl.O		23'30'	26'	+24'55"	+23'58'	22'45'	+23'18'
10				+26' ✓	30'20' ✓	+28'10'	I.D	I.D	
12				Bl.O	Bl.O				
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 40 CM

SUBJECT: J.R. NO: 6

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
+0.50	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
+1.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
+1.50	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
+2.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
+2.50	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
-0.50	+14'45'	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
-1.00	[illegible]	26'	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
-1.50	D	D		D	D		D	D	
-2.00									
-2.50									

MAGNITUDE OF FIXATION DISPARITY

SUBJECT: S.N. NO: 2

4.25m Fxd. Fxd.' Fxd."

	Fxd. R	Fxd. L	Fxd.' R	Fxd.' L	Fxd." R	Fxd." L
1	38"	1'16"	38"	+38"	38"	+1'16
2	2'32"	1'16"	1'16"	+1'16"	1'16"	38"
3	1'16"	[illegible]	1'16"	+1'54"	38"	+1'16"
4	38"	1 [illegible]	38"	0	1'16"	0
5	1'16"	1'54"	38"	+38"	1'16"	+38"
	Ave: 1'16" exo	Ave: 1'24" exo	Ave: 53" exo	Ave: 53" exo	Ave: 1'1" exo	Ave: 46" exo
	Mean: 4" exo		Mean: 53" exo		Mean: 54" exo	

40cm.

	R	L	R	L	R	L
1	14'5"	+10'50"	5'25"	+5'25"	4'20"	+5'25"
2	15'10"	+11'55"	5'25"	+8'40"	4'20"	+4'20"
3	13	+10'50	7'35"	+5'25"	6'30"	+4' [illegible]
4	16'15"	+1[illegible]	5'25"	-8'40"	5'25"	+4 [illegible]
5	13'	+11'55"	5'25"	+4'20"	4'20"	+3'15"
	Ave: 14' [illegible] exo	Ave: 1[illegible] exo	Ave: 5'51" exo	Ave: 6'30" exo	Ave: 4'59" exo	Ave: 4'20" exo
	Mean: 12' [illegible] exo		Mean: 6'11" exo		Mean: 4'40" exo	

20cm.

	R	L	R	L	R	L
1	11'42"	+8'40"	2'10"	+5'12"	0	+1'5"
2	7'43"	+6'30"	5'12"	+4 [illegible]	0	+1'5"
3	8'14"	+8'14"	5'12	+5'12"	1'5"	0
4	[illegible]	+8' [illegible]	[illegible]	+4 [illegible]	0	0
5	8'42"	9 [illegible]	[illegible]	[illegible]	0	0
	Ave: 8'38" exo	Ave: 8'19 exo	Ave: 3'33" exo	Ave: 4'40 exo	Ave: 15" exo	Ave: 26 exo
	Mean: 8'38" exo		Mean: 4'7" exo		Mean: 20" exo	

CURVES DUE TO INDUCED PRISM AT 4.25 M

SUBJECT: S.N. NO: 9

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
4	3'10"	+1'16"	-2'13"	1'54"	+1'54	-1'54	2'32"	+1'16"	-1'54"
8	3'10"	[illegible]8"	-2'24	1'54"	+1'54"	-1'5[illegible]	1'54'	+[illegible]8"	-2'52"
12	3'48"	+1'16"	-2'32"	[illegible]32"	+1'54"	-2'1[illegible]	3'10"	+2'32"	-2 [illegible]
16	6'58 B	+6'20'	-6'38"	[illegible]	+1'[illegible]	-2'15"	6'56"	-[illegible]'20'	-6'[illegible]
20	10'8"	+6'58'	-8'32"	-4"	+5'42'	-5'23'	7'[illegible]	+[illegible]6"	-8'52"
24	13'56'	+10'8'	-12'	[illegible] B	+7'[illegible]	-6'57"	B.O	[illegible]	
28	Bl.O	Bl.O		Bl.O	Bl.O				
32									
36									
40									

Base-In Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
2	1'16"	1'16'	0	1'16'	0	-38"	0	0	0
4	+5'10"	3'10'	+4'49"	+38"	0	+19"	+2'32"	3'10"	+2'51"
6	+7'36"	10'8'	+8'57	+1'54'	1'[illegible]	+1'16"	+5'[illegible]	[illegible]	+5'42"
8	+15'12'	21'32'	+18'22"	+[illegible]	2'32'	+2'32	+[illegible]14'	7[illegible]	+[illegible]52"
10	+15'12'	21'32'	+18'[illegible]	+14'[illegible]	+[illegible]56'	+15'12'	[illegible]	+[illegible]	+[illegible]
12	D	D		D	D		D	D	
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 4.25 M

SUBJECT: S.N. NO: 7 B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
+0.50	2'32"	0	-1'16"	2'32"	+1'54"	-2'13"	38"	+1'16"	-57"
+1.00	Bl.O	Bl.O		Bl.O	Bl.O		Bl.O	Bl.O	
+1.50									
+2.00									
+2.50									

Minus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
-0.50	+5'44	6'58'	+6'1'	1'16"	38'	-19"	+1'54	[illegible]	+1'54
-1.00	+11'24	12'[illegible]	[illegible]	0	38"	+19	[illegible]	5'18"	[illegible]
-1.50	+11'24	16'28 B	[illegible]	+5'4"	3'10"	+4'1	[illegible]	[illegible]	[illegible]
-2.00	D	D		D	D		5'4	5 +	[illegible]
-2.50							[illegible]	18'[illegible]	[illegible]

NOTE: [illegible]

CURVES DUE TO INDUCED PRISM AT 40 cm

SUBJECT: S.N. NO: 7

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
4	14'5"	+13'	-13'33"	9'45"	+11'55"	-10'50"	6'30"	+4'40"	-5'25"
8	14'5"	+14'5"	-14'5"	9'45"	+9'45"	-9'45"	6'30"	+4 [illegible]	-5' [illegible]
12	15'10"	+14'5"	-14'38"	9'45"	+7'35"	-8'40"	6'30"	+6'40"	[illegible]
16	21'40"	+17	-19'30	9'45"	+9'45"	-9'45"	6'30"	+8'4[illegible]	-7'[illegible]
20	22'45'	+17'20"	-20'3"	9'45'	+6'32"	-8'6"	Bl.O	Bl.O	
24	Bl.O	Bl.O		[illegible]	Bl.O				
28									
32				Note wants to	Patient felt align	that he monocular			
36				stimulus very rapid is used	elements flashes	unless a fixation			
40									

Base-In Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
2	5'25"	+5'25'	-5'25'	4'20"	+2'10"	-3'15"	3'15"	+3'15"	-3'15"
4	4'20"	+5'25"	[illegible]	0	15	-33"	1	[illegible]	-1'38"
6	2'10"	+1'5"	-1'[illegible]	+1'5"	1'5"	+1'5"	0	+15	-35"
8	+1'5"	3'15"	+2'10'	+2'10'	5'15"	-7'43"	+2 [illegible]	1'5"	+1'38"
10	+2'10'	5'5"	[illegible]	+3'15"	5'25'	[illegible]	[illegible]	3'25"	+4'20"
12	+4'25'	7'.5'	+5'[illegible]	+13'	13'	+13'	[illegible]	5'25'	+7'55"
14	+10'50"	15'10"	+13	[illegible]	14'5'	+13'	[illegible]	[illegible]	+10'18'
16	+[illegible] 15"	15'10'	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]
18	+16'15	14'5"	+15'				[illegible]	[illegible]	[illegible]
20	+16'15"	17'25	+17'[illegible]				[illegible]	Bl.O	
22	I.D.	I.D.							

CURVES DUE TO INDUCED LENSES AT 40 cm

SUBJECT: S.N. NO: 7

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
+0.50	18'25"	+10'15"	-17'20"	7'55"	+6'50"	-7'3"	4'20"	+3'25"	-3'48"
+1.00	19'30"	+17'20"	-18'25"	10'50"	13"	-11'55'	5'25"	[illegible]	-5'25"
+1.50	26'	+21'40"	-23'50"	8'45"	+9'45"	-9'15	7'35"	+5'25"	-6'50"
+2.00	Bl.O	Bl.O		Bl.O	Bl.O		Bl.O	Bl.O	
+2.50									

Minus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
-0.50	10'50"	-9'45'	-10'15'	+15"	0	+33	0	[illegible]	-33"
-1.00	5'25"	-3'15'	-4'20"	+3'15"	5'25'	+4'20"	+2'1	2'10"	+2'10"
-1.50	0	1'5"	+33	+10'50"	13"	-11'55	+5'25"	[illegible]	+5'58"
-2.00	Bl.O	24		[illegible]	Bl.O		[illegible]	[illegible]	
-2.50									

MAGNITUDE OF FIXATION DISPARITY

SUBJECT: C.J. **NO:** 8

4.25m

	Fxd. R	Fxd. L	Fxd.' R	Fxd.' L	Fxd." R	Fxd." L
1	+8'14"	7'36"	+7'36"	8'14"	+5'4"	6'20"
2	+5'4"	7'36"	+6'20"	8'52"	+7'36"	6'58"
3	+[illegible]	8'52"	+6'	8'52"	+8'14"	5'4"
4	+3'20"	7'	+[illegible]	6'58"	+7'36"	8'14"
5	+3'20"	6'20"	+[illegible]'20"	8'52"	+5'4"	6'20"
	Ave: 5'4" eso	Ave: 7'36" eso	Ave: 6'20" eso	Ave: 8'22" eso	Ave: 6'43" eso	Ave: 6'35" eso
	Mean: 6'20" eso		Mean: 7'21" eso		Mean: 6'39" eso	

40cm.

	R	L	R	L	R	L
1	+21'40"	24'55"	+8'40"	9'45"	+6'30"	4'20"
2	+23'50"	26'	+7'35"	7'35"	+5'25"	4'20"
3	+20'30"	18'25"	+8'40"	10'50"	+7'35"	5'25"
4	+22	22'[illegible]	+9'45"	7'35"	+6'30"	6'30"
5	+19'30"	21'40"	+10'50"	7'35"	+5'25"	7'35"
	Ave: 21'27" eso	Ave: 22'37" eso	Ave: 9'6" eso	Ave: 8'14" eso	Ave: 6'17" eso	Ave: 5'38" eso
	Mean: 22' eso		Mean: 8'40" eso		Mean: 5'58" eso	

20cm.

	R	L	R	L	R	L
1	0	2'10"	0	2'10"	4'20"	2'10"
2	0	3'[illegible]	+2'10"	0	+2'10"	+4'20"
3	+52"	1'28"	2'10"	4'20"	+2'10"	+1'18
4	0	7'[illegible]	0	0	5'12"	0
5	1'18"	5'12"	0	2'10"	+[illegible]	0
	Ave: 5" exo	Ave: 4'15" eso	Ave: 0	Ave: 1'44" eso	Ave: 26" exo	Ave: 42" exo
	Mean: 2'5" eso		Mean: 52" eso		Mean: 34" exo	

CURVES DUE TO INDUCED PRISM AT 4 [illegible]

SUBJECT: [illegible]   NO: 8

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
4	0	2'5"	+1'[illegible]	+2'[illegible]	1'[illegible]	+2'15"	+1'54	3'10"	+2'32"
8	0	1'16'	+[illegible]	[illegible]	3[illegible]	0	0	+38"	-19"
12	1'[illegible]	1 10'	-19'	1'1[illegible]	0	-38"	0	0	0
16	[illegible]	+1'10	-4 26	[illegible]	[illegible]	-38"	0	+[illegible]	-19"
20	[illegible]	+1'[illegible]	[illegible]	4 2[illegible]'	+1'54"	-3'26'	1'10"	+[illegible]	-57"
24	D	D		D	D		D	D	
28									
32									
36									
40									

Base-In Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
2	+10'8"	10'8"	-10'8"	+7'36'	-9'36"	+8'33"	+9'36'	[illegible]	+8'[illegible]"
4	D	D		ID	ID		+10'8"	11'[illegible]	+[illegible]'
6							D	D	
8									
10									
12									
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 4.25M

SUBJECT: L.T.   NO: 8

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
+0.50	Bl.O	Bl.O		+6'20"	6'58'	+6'39	+7'36'	8'14'	+7'55
+1.00				Bl.O	Bl.O		Bl.O	Bl.O	
+1.50									
+2.00									
+2.50									

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
-0.50	+9'30	10'8"	+9'49"	+6'58"	6'58"	+6'58	+8'52"	9'36'	+9'14
-1.00	Bl.O	Bl.O		Bl.O	Bl.O		+20'16'	22'45'	+21'32"
-1.50							D	D	
-2.00									
-2.50									

CURVES DUE TO INDUCED PRISM AT 40 cm

SUBJECT: L. J. NO: 8

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	X	R	L	$\bar{X}$
4	+11'35	11'35	+11' [illegible]	+6'30'	[illegible]	[illegible]	+2'30	[illegible]	+2'45
8	[illegible]	2	+5'35'	+3'15'	0	[illegible]	0	1'	+1'5"
12	[illegible]	5'25	[illegible]	2'30	0	+1'5	0	0	0
16	[illegible]	0	+1'38'	[illegible]	[illegible]	-3'15'	[illegible]	[illegible]	-2'43'
20	[illegible]	[illegible]	-7'05'	[illegible]	+6' [illegible]	[illegible]	[illegible]	-1'	-3'15'
24	[illegible]	+21'43	-22'4	[illegible]	+1'	[illegible]	[illegible]	+5'24'	[illegible]
28	[illegible]	D		14'5'	+20'55'	[illegible]	[illegible]	[illegible]	-6'43'
32				I	I		EV	[illegible]	
36									
40									

Base-In Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
2	+23'55'	21'[illegible]	+21'[illegible]"	+13'	10'50'	+11'55"	+7'35'	7'56'	+7 [illegible]
4	+24'55	28'10'	[illegible]	+17'50'	21'40'	+20'35'	+8'40"	6'35'	+7'35'
6	E.D.	E.D.		E.D.	E.D.		+17'[illegible]	14'3"	+15'42"
8							+20'35	22'45'	-21'40'
10							D	D	
12									
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 40cm

SUBJECT: LT NO: 2

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	I	X̄	1 Week After Training (Fxd') R	L	X̄	6 Weeks After Training (Fxd") R	L	X̄
+0.50	+11'35"	1[illegible]	+14'7"	+5'4[illegible]	5'25"	+5'[illegible]	+5'25"	4'[illegible]	+4'53"
+1.00	[illegible]	8'40"	+9'13"	+5'25"	1'[illegible]	+5'15"	-1'[illegible]	3'35"	+3'15"
+1.50	+7'35"	[illegible]	+9'[illegible]	[illegible]	1'5"	+2'1"	+2'[illegible]	0	+1'5"
+2.00	+5'25"	5'25"	+5'25"	+2'1"	+2'5"	+2'2"	+1'5"	0	+[illegible]
+2.50	+6'10"	5'75"	+4'45"	+[illegible]	+1'5"	+[illegible]	+1'5"	0	+35"

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	X̄	1 Week After Training (Fxd') R	L	X̄	6 Weeks After Training (Fxd") R	L	X̄
-0.50	+29'15"	30'20"	+29'48"	+14'5"	1[illegible]'15"	+15'10"	+7'55"	8'40"	+8'8"
-1.00	Bl.O	Bl.O		+29'25"	27'5"	+28'10"	+22'40"	27'5"	+24'25"
-1.50				Bl.O	Bl.O		32'25"	35'45"	+33'45"
-2.00							Bl.O	Bl.O	
-2.50									

MAGNITUDE OF FIXATION DISPARITY

SUBJECT: P.K. NO: 9

4.25m Fxd. Fxd.' Fxd."

	R	L	R	L	R	L
1	3'10"	+1'54	1'16"	+3'10"	1'16"	+1'16"
2	3'48"	+2'32	2'32"	+3'48"	1'16"	+2'32"
3	-3'10"	+2'32"	- 8	[illegible]	1'16"	+2'32"
4	+2'32"	-1'54	48	+1'54	38"	+3'10"
5	3'48"	-1'54"	3'10"	+1'54"	1'16"	+1'16"
	Ave: 1'1" exo	Ave: 1'9 exo	Ave: 2'40" exo	Ave: 3'2" exo	Ave: 1'8" exo	Ave: 2'9" exo
	Mean: 1'5" exo		Mean: 2'51" exo		Mean: 1'39" exo	

40cm.

	R	L	R	L	R	L
1	9'45"	+9'45"	5'25"	+8'40"	4'20"	+8'40"
2	9'45"	+10'50"	7'35"	+7'35"	5'25"	+4'20"
3	[illegible]	[illegible]	6'30	+8'40"	5'25"	+10'50
4	8'40"	[illegible]	30"	+9'45"	6'30"	+8'40"
5	10'50"	+11'55"	7'35"	+10'50"	3'15"	+4'20"
	Ave: 9'32" exo	Ave: 10'24"	Ave: 6'43" exo	Ave: 9'6" exo	Ave: 4'59" exo	Ave: 7'22" exo
	Mean: 9'57" exo		Mean: 7'54" exo		Mean: 6'11" exo	

20cm.

	R	L	R	L	R	L
1	26'	[illegible]	4'4[illegible]	+4 20'	3'15"	[illegible]
2	26'	[illegible] 10'	3'54"	[illegible]	5'25"	[illegible]
3	[illegible]'50"	[illegible]	[illegible]	[illegible]	5'25"	+4 [illegible]
4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	[illegible]	[illegible]	[illegible]	[illegible]	5'15	+4'[illegible]
	Ave: 24 47 [illegible]	Ave: [illegible]	Ave: [illegible] exo	Ave: [illegible] exo	Ave: [illegible]	Ave: 4 59 [illegible]
	Mean: 24 14' [illegible]		Mean: 4 24 exo		Mean: 4 53 exo	

CURVES DUE TO INDUCED PRISM AT 4.25 M

SUBJECT: R.K.   NO: 9

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\overline{X}$	R	L	$\overline{X}$	R	L	$\overline{X}$
4	5'4	+2'[illegible]	-5'48"	6'20"	-[illegible]	-6'39	3'10"	+3'[illegible]	-3'[illegible]
8	5'47	+4'[illegible]	-5'5"	10'3	+8'21	-9'30"	4'25"	-5'	-3'49"
12	10'4[illegible]	+5'41	-8'14	[illegible]	+8'16	-4'[illegible]	+'20"	+4'24"	-5'23"
16	D	D		BLO	BLO		10'8" B	+3'48" B	-6'56"
20							[illegible]	BLO	
24									
28									
32									
36									
40									

Base-In Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\overline{X}$	R	L	$\overline{X}$	R	L	$\overline{X}$
2	1'16"	D	-38"	1'16"	+2'32"	-1'59"	+2'32"	1'16"	+1'54"
4	+6'20"	5'42"	+6'1"	+2'32"	2'32"	+2'[illegible]	+6'58"	5'10"	+5'4"
6	D	D		+15'56"	13'18"	+15'39	+15'12	15'50"	+15'31
8				BLO	BLO		ID	ID	
10									
12									
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 4.25M

SUBJECT: P.K. NO: 9

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	X̄	1 Week After Training (Fxd') R	L	X̄	6 Weeks After Training (Fxd") R	L	X̄
+0.50	1'5"	+1'[illegible]	-1'[illegible]	3'10'	+2'32	-[illegible]	3'6"	+32'	-38'
+1.00	BLO	BLO		BLO	BO		BLO	BO	
+1.50									
+2.00									
+2.50									
+0.75	2'32	0	-1'16	3'48"	+3'20'	-3'29'	1'54"	+32'	-1'11'

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	X̄	1 Week After Training (Fxd') R	L	X̄	6 Weeks After Training (Fxd") R	L	X̄
-0.50	1'16"	+1'[illegible]	-1'[illegible]	1'16"	+1'16'	-1'16"	+1'54	1'16"	+1'35
-1.00	1'16'	+38"	-49'	0	+1'16"	-38	+3'10"	3'8'	+3'29
-1.50	0	1'16"	+38	0	+1'54	-57"	+4'26'	4'26"	+4'26'
-2.00	0	38"	+19"	+1'16"	0	+38"	+5'4"	5'42'	+5'23
-2.50	+1'16"	1'54	+1'35	+2'32	2'32'	+2'32"	+5'4"	5'42"	+5'[illegible]

CURVES DUE TO INDUCED PRISM AT 40cm

SUBJECT: P NO: 5

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving ; V = Variable

Base-Out Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
4	14'5'	+[illegible]	-14'5'	13'	+1[illegible]	-17'[illegible]	16'15'	[illegible]	-16'48'
8	20'35'	+1[illegible]	-18'56'	16 15'	-1[illegible]	-15'[illegible]	15'10'	-14 5'	-14'30'
12	[illegible]	+21'4[illegible]	-23'18'	19'50'	-1[illegible]	-17'53'	1[illegible]'5'	+1"	-12'23'
16	D	D		[illegible]	+18'[illegible]	-20'3'	16'15'	+15'3'	-15'38'
20				[illegible]	+20'35'	-22'6"	B.O.	B.O.	
24				B.O.	B.				
28									
32									
36									
40									

Base-In Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
2	9'45"	+4'4[illegible]	-9'45"	5'25"	+4'2[illegible]	-4'53"	2'[illegible]	+2'[illegible]	-2'[illegible]
4	5'25'	+[illegible]	-4'53'	0	0	0	+3'15'	+1[illegible]	+1'5"
6	2'10'	+2'[illegible]	-2'10'	+4'20'	1'5"	+2'43"	+4'20'	3'15	+3'4[illegible]
8	1'[illegible]	+2'1[illegible]	-1'3[illegible]	+9'45'	7'35'	+8'40"	+9'45"	[illegible]	+8'[illegible]
10	0	0	0	+15'	13'	+13'	+17'50'	14 5'	+15'48'
12	+15'	0	+38'	14'5	15'	+15'33'	NM	NM	
14	-2'10"	1'5'	+1'38'	ID	I.D.				
16	-4'20'	3 15'	+3'48'						
18	-4'30	3'1'	+4'48"						
20	-10'50'	10'50'	+10'50'						
22	B.O.	B.O.							

CURVES DUE TO INDUCED LENSES AT 40cm

SUBJECT: [illegible] NO: 9 B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	X̄	1 Week After Training (Fxd') R	L	X̄	6 Weeks After Training (Fxd") R	L	X̄
+0.50	14'5"	+1'5"	-14'2"	4'2"	+7"	-4'53"	9'45"	+9'45"	-9'45"
+1.00	[illegible]	+2 [illegible]	-22.[illegible]	[illegible]	+4'2	-4'53'	11'55"	+[illegible]	-12'27
+1.50	[illegible]	Bl.		[illegible]	Bl		Bl.O	Bl.O	
+2.00									
+2.50									

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	X̄	1 Week After Training (Fxd') R	L	X̄	6 Weeks After Training (Fxd") R	L	X̄
-0.50	7'35"	+7'35"	-7'35"	4'10"	+3'25"	-3'[illegible]	3'15"	+4'20"	-3'48"
-1.00	4'20"	+4'20"	-4'[illegible]	2'1.[illegible]	-[illegible]'25"	-2'30"	0	+3'15"	-1'38"
-1.50	1'5"	+3'15"	-[illegible]'[illegible]	+7'[illegible]	[illegible]'25"	+2[illegible]	+1'5"	+[illegible]'10"	-35"
-2.00	1'5"	+1'5"	-1'[illegible]	+4'20"	4'20"	+4'20"	+2'10"	+1'5"	+33"
-2.50	+1'5"	1'5"	+1[illegible]	+4'20"	4'20"	+4'20"	+5'25"	5'15"	+[illegible]

MAGNITUDE OF FIXATION DISPARITY

SUBJECT: [illegible] **NO:** [illegible]

4.25m

	Fxd. R	Fxd. L	Fxd.' R	Fxd.' L	Fxd." R	Fxd." L
1	38"	38"	0	38"	0	38"
2	0	1'16"	+38"	38"	+38"	1'16"
3	+1'16"	[illegible]	+38"	1'16"	+38"	0
4	+1'54"	[illegible]	+1'1[illegible]	1'16"	+1'16"	[illegible]
5	+1'1[illegible]	1'[illegible]	+1'54"	1'16"	+1'54"	38"
	Ave: [illegible] eso	Ave: 2'17" eso	Ave: 53" eso	Ave: 1'1" eso	Ave: 53" eso	Ave: 38"
	Mean: 1'32" eso		Mean: 57" eso		Mean: 46" eso	

40cm.

	R	L	R	L	R	L
1	4'20"	+3'15"	0	+1'5"	2'10"	0
2	7'35"	+5'25"	0	+2'10"	+2'10"	+2'10"
3	6'30	+4'[illegible]	0	+2'10"	+1'5	+1'5"
4	6'30"	[illegible]	1'5"	+5'[illegible]	0	0
5	4'20"	+[illegible]	0	+4'20"	1'5"	+2'10"
	Ave: 5'51" exo	Ave: [illegible] exo	Ave: 13" exo	Ave: 2'36" exo	Ave: 0	Ave: 1'5" exo
	Mean: [illegible]		Mean: 1'25" exo		Mean: 33" exo	

20cm.

	R	L	R	L	R	L
1	5'2"	[illegible]	2'[illegible]	[illegible]	+51	[illegible]
2	4'[illegible]	+[illegible]'28"	0	[illegible]	0	[illegible]
3	3'1"	+1'[illegible]	52"	[illegible]	0	[illegible]
4	[illegible]	+2'[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Ave: 5'15" [illegible]	Ave: [illegible]	Ave: [illegible]	Ave: 5'[illegible] exo	Ave: 10" [illegible]	Ave: [illegible]
	Mean: 32 [illegible]		Mean: 2'10" exo		Mean: 1'5" [illegible]	

CURVES DUE TO INDUCED PRISM AT 4.25M

SUBJECT: [illegible]   NO: [illegible]

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\overline{X}$	1 Week After Training (Fxd') R	L	$\overline{X}$	6 Weeks After Training (Fxd") R	L	$\overline{X}$
4	3'10'	+38"	-1'[illegible]	1'4'	0	-35'	36'	[illegible]	-1'[illegible]
8	2'52'	0	-1'[illegible]	1'[illegible]	+[illegible]	-1'1'	58'	+1'	[illegible]
12	3'0	0	-1'[illegible]	1'[illegible]	+1	-1'[illegible]	1'16	+1	-1'[illegible]
16	[illegible]	[illegible]		[illegible]	[illegible]		-32'	+1'[illegible]	-2'1
20									
24									
28									
32									
36									
40									

Base-In Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\overline{X}$	1 Week After Training (Fxd') R	L	$\overline{X}$	6 Weeks After Training (Fxd") R	L	$\overline{X}$
2	+5'[illegible]	3'48"	+4'26"	+5'48'	4'20'	+4'[illegible]	+3'10'	1'[illegible]	+2'13'
4	+8'52"	8'[illegible]	+8'31'	+6'58'	[illegible]58'	+6'57'	+4'[illegible]	3'10'	+3'48
6	+19'2" E.V.	11'[illegible]	+15'11'	+20'48	20'16'	+21'[illegible]	+12'[illegible]	[illegible]	+23
8	ID	ID		ID	ID		ID	ID	
10									
12									
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 4.25 M

SUBJECT: E C   NO: 1)   B = Blur   Bl.O = Blur Out   D = Diplopia   E.V. = Extremely Variable

I.D. = Intermittent Diplopia   J = Numbers jumping in and out of focus

N.M. = Numbers moving   V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	X̄	R	L	X̄	R	L	X̄
+0.50	+1'16"	3'48	-2'32'	0	1'54	+57'	+38'	1'1[illegible]	+[illegible]7"
+1.00	[illegible]	B.O		[illegible]	B.O				
+1.50									
+2.00									
+2.50									

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	X̄	R	L	X̄	R	L	X̄
-0.50	+5'4	0	+2'32	+5'4'	4'25"	+4'45"	+3'48	3'48	+3'48
-1.00	-15'2	10'8'	+11'55'	+10'8'	10'8"	+10'8'	+[illegible]	6'20'	+8'[illegible]
-1.50	+[illegible]	16'20	-[illegible]'28	+7[illegible]	21'32'	+20'54'	-12'40	17'44	+15'12
-2.00	J	J		+15'20'	22'48'	+2[illegible]	J	J	
-2.50				[illegible]	B.O				

CURVES DUE TO INDUCED PRISM AT 40cm

SUBJECT: E.C. NO: [illegible]

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity: Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
4	10'50'	[illegible]	[illegible]	[illegible]	[illegible]	-2'10'	0	+3'15'	-1'38'
8	16'25'	[illegible]	-16'48	[illegible]	[illegible]	-5'25'	3'15'	[illegible]	-2'45'
12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-9'45'	3'15'	[illegible]	-3'46'
16	[illegible]	[illegible]		[illegible]	-8 [illegible]	[illegible]	2'15	[illegible]	-4'53'
20				17	[illegible]	[illegible]	2'20'	[illegible]	[illegible]
24				[illegible]	[illegible]	-10'28'	I.D	I.D	
28				[illegible]	[illegible]	[illegible]			
32				[illegible]	[illegible]				
36									
40									

Base-In Prism	Magnitude of Fixation Disparity: Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
2	0	+2'10'	-1'5	+1'5'	[illegible]	0	+3'15	1'5'	+2'30'
4	+2'10'	[illegible]	[illegible]	+5'25'	2'50'	+3'48'	+4'20'	[illegible]	+3'48'
6	+4'20'	5'25'	+4'53'	+5'25'	3'35'	+4'20'	+9'45'	5'25'	[illegible]
8	+9'45'	9'45	[illegible]	+9'45'	5'25'	+7'35'	-10'50'	[illegible]	+8'48'
10	+20'35'	18'25'	+19'30'	+14'5'	14'5'	+14'5'	[illegible]	15'15'	+16'48'
12	+29'15'	26	+27'38'	+28'10'	26'	[illegible]	E.V	E.V	
14	I.D	I.D		+30'20'	32'30'	+31'25'			
16				I.D	I.D				
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 40cm

SUBJECT: [illegible] NO: 11

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	Before Training (Fxd) L	Before Training (Fxd) $\bar{X}$	1 Week After Training (Fxd') R	1 Week After Training (Fxd') L	1 Week After Training (Fxd') $\bar{X}$	6 Weeks After Training (Fxd") R	6 Weeks After Training (Fxd") L	6 Weeks After Training (Fxd") $\bar{X}$
+0.50	4'20"	[illegible]	-4'33"	1'5	+5'25"	-3'7[illegible]	0	+15	-33"
+1.00	5'25"	+5'25"	-5'25"	[illegible]	[illegible]	[illegible]	1'5"	[illegible]	[illegible]
+1.50	7 [illegible]	[illegible]	56	0	-7	-1'40"	[illegible]	[illegible]	[illegible]
+2.00	B.O.	B.O.		5'25	+14'5"	-4'45"	1'5"	+4'[illegible]	-3'45"
+2.50				1--	BO		B.O.	Bl.O	

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	Before Training (Fxd) L	Before Training (Fxd) $\bar{X}$	1 Week After Training (Fxd') R	1 Week After Training (Fxd') L	1 Week After Training (Fxd') $\bar{X}$	6 Weeks After Training (Fxd") R	6 Weeks After Training (Fxd") L	6 Weeks After Training (Fxd") $\bar{X}$
-0.50	+4'20"	5'7	+4'5	0	0	0	+5'35"	+1'5"	+2'10"
-1.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	+5'45"	+7'35	2'10"	[illegible]
-1.50	+23'55"	27'5"	+25'30"	-15"	9'45	11	+14'5"	10'5"	+12'25
-2.00	B.O.	B.O.		B.O.	B.O.		+22'45	21'45	[illegible]
-2.50							J	J	

MAGNITUDE OF FIXATION DISPARITY

SUBJECT: T.K. NO: 11

4.25m Fxd. Fxd.' Fxd."

	Fxd. R	Fxd. L	Fxd.' R	Fxd.' L	Fxd." R	Fxd." L
1	1'16'	0	1'54"	+1'54"	1'16"	+1'16"
2	1'16"	38	1'54"	+1'16"	1'54"	38"
3	[illegible]"	[illegible]"	1'54"	-1'16"	38"	-38'
4	1'16"	2'[illegible]"	1'54"	+1'54	1'16"	+1'54"
5	1'16"	[illegible]	2'32"	+1'16"	2'32"	+2'32"
	Ave: 1'8 exo	Ave: 53" exo	Ave: 2'2 exo	Ave: 1'31" exo	Ave: 1'31" exo	Ave: 1'8" exo
	Mean: 8" exo		Mean: 1'47" exo		Mean: 1'20" exo	

40cm.

	R	L	R	L	R	L
1	16'15"	+14'5'	4'20"	+3'15'	4'20'	+4'20'
2	18'25"	+15'10"	1'5"	+1'5"	4'20"	+5'25"
3	15'10"	+11'[illegible]"	0	+2'[illegible]	5'25"	+7'25"
4	14'5'	[illegible]	0	+2'[illegible]	5'25"	+7'35"
5	14'5"	+10'24"	3'15"	+2'10"	5'25"	+6'30"
	Ave: 15'36" exo	Ave: 13'25" exo	Ave: 1'44" exo	Ave: 1'44' exo	Ave: 4'59" exo	Ave: 6'17" exo
	Mean: 14' [illegible] exo		Mean: 1'44' exo		Mean: 5'38" exo	

20cm.

	R	L	R	L	R	L
1	15'10	+10'[illegible]	1'44'	+2'[illegible]	2'10"	+ 1'31
2	15'10"	+3'48'	4'20"	+4'[illegible]"	2'10"	+ 2'10"
3	19'30	+17'28"	2'10"	+4'10'	30"	+1'[illegible]
4	19'30"	+13'	5'13"	+5'28"		+1'5"
5	17'7	+10'30'	4'20'	+2'[illegible]"	2'10	+2'10'
	Ave: 17'26" exo	Ave: 12'8" exo	Ave: [illegible]3 exo	Ave: 3'47" exo	Ave: 1'46 exo	Ave: 1'42 exo
	Mean: 14'44' exo		Mean: 3'48 exo		Mean: 1'34" exo	

CURVES DUE TO INDUCED PRISM AT 4.25 M

SUBJECT: T.K. NO: 41

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	X	R	L	$\bar{X}$
4	7'56"	[illegible]	[illegible]	5'[illegible]	[illegible]	-4'26"	5'42"	-3'48"	-4'46"
8	16'8"	+8'[illegible]	-9'[illegible]	7'1	+5'[illegible]	-6'39"	1'30"	+8'[illegible]	-7'1
12	27'37"	[illegible]	[illegible]	[illegible]	+11'[illegible]	-10'46"	15'8"	[illegible]	-10'27
16	B[illegible]	Bl.O		15'2	+15'	15'51	13'56"	+15'2"	-14'[illegible]
20				17'44	+17'[illegible]	-17'[illegible]	Bl.O	Bl.O	
24				E.V.	E.V.				
28									
32									
36									
40									

Base-In Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
2	0	3'48"	+1'54	1'54"	+38"	-1'16"	1'16"	-38"	-57
4	+13'56"	13'56"	+13'56"	+2'32"	1'16"	+1'54"	+38"	1'54	+1'16
6	ID	ID		+8'52	11'24"	+10'[illegible]	+54	6'20"	+5'42"
8				ID	ID		ID	ID	
10									
12									
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 1.25 M

SUBJECT: [illegible] **NO:** [illegible]

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
+0.50	1'26"	[illegible]	-1'1"	1'16"	+1'1"	-1'12"	1'16"	+38"	-57"
+1.00	[illegible]	[illegible]		[illegible]	[illegible]				
+1.50									
+2.00									
+2.50									

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
-0.50	38"	2'32"	+57"	1'16"	38"	-19"	+1'16"	+1'14"	0
-1.00	+1'16"	3'30"	+2'15"	0	2'32"	+1'14"	D	[illegible]	-19"
-1.50	+3'48"	6'58"	-[illegible]'23"	+1'54"	[illegible]	+3'10"	+1'16"	4'26"	+2'51"
-2.00	Bl.O	Bl.O		+2'32"	[illegible]4	+2'48"	+3'48"	5'4"	-4'26"
-2.50				+[illegible]'30"	7'[illegible]	+6'58"	+3'48"	5'42"	+4'46"

CURVES DUE TO INDUCED PRISM AT 40 cm

SUBJECT: T.K. NO: 11

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\overline{X}$	R	L	X	R	L	$\overline{X}$
4	30 20	-22'40	-2	4'20"	[illegible]	-5'58"	6'30"	+4'45"	-5'57"
8	[illegible]	[illegible]		5'5"	[illegible]	-35"	10'50"	+8'40"	-9'45"
12				16'50"	-9'40"	-13'15"	11'55"	+10'50"	+11'47"
16				14'5"	-11'	-13'35"	11'15"	+10'15"	-10'15"
20				14'5"	+11'55'	-13'	10'35"	[illegible]	-15'10"
24				11'5"	+14'5"	-15'10"	B.O.	B.O.	
28				B.O.	B.O.				
32									
36									
40									

Base-In Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\overline{X}$	R	L	$\overline{X}$	R	L	$\overline{X}$
2	15'10"	+10'50"	-13'	3'15"	+1'5'	-2'10"	0	0	0
4	5'25"	+1'5"	-3'15"	0	+1'5"	-43"	0	+1'5'	-33"
6	+3'15"	4 20	+5'48	+1'5"	2'10"	+1'38"	+2'10"	1'5"	+1'43"
8	+5'25'	6'30"	+5'58"	+1'5"	2'10"	+1'38"	+2'10"	0	+1'5"
10	-5'25	7'35"	+6'30"	0	4'10"	+2'10"	-2'10"	[illegible]	+2'10"
12	+8'40'	15'10"	+11'55"	+4'20"	6'30"	+5'25"	+4'20"	5'45"	+4'52"
14	+10'50"	15'10"	+13	+4'20"	6'30"	+5'25	+8'40"	5'[illegible]	+7'[illegible]
16	+17'20"	19'30"	+18'25"	+7'55"	9'45"	+8'40"	+8'40"	10'50"	+9'45"
18	+17'20"	21'[illegible]	+19'30"	+7'25"	10'50"	+9'3	+13'	14'5"	+13'32'
20	+21'40	27'5"	+24'23	+10'50"	14'5"	+12'27"	+15'10"	16'15"	+15'42"
22	D	D		D	D		+17'20"	19'30'	+18'25'

CURVES DUE TO INDUCED LENSES AT 40 cm

SUBJECT: T.K. NO: 11 B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
+0.50	27'5"	[illegible]	-28'30'	[illegible]	+6'20'	[illegible]	5'15'	[illegible]	-4'52'
+1.00	[illegible]	+7'15' V	-35'53'	[illegible]	+6'25'	[illegible]	9'15'	+8'4[illegible]	-9'12'
+1.50	[illegible]	[illegible]	[illegible]25'	[illegible]	+9'45'	-8'4[illegible]	14'5'	+1'	-1'32'
+2.00	[illegible]	[illegible]		25'[illegible]	+16'5'	-15'45'	21'40'	[illegible]	[illegible]
+2.50				[illegible]	+27'20'	-18'26'	[illegible]	[illegible]	

Minus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
-0.50	16'15'	+21'4[illegible]'	-19'58"	4'20'	-2'10'	-3'15'	5'15'	-5'15'	-3'15'
-1.00	5'45'	+6'30'	-5'58'	1'5'	1'4[illegible]'	0	1'5'	+7'[illegible]	-2'15'
-1.50	+2'15'	5'15'	+2'15'	[illegible]	[illegible]	+2'[illegible]	+1[illegible]	2'10'	+1'27'
-2.00	+6'30'	6'30'	+6'30'	+5[illegible]	5'25'	+4'20'	+8'40'	5'25'	+4'2[illegible]
-2.50	+0'40'	9'45'	+5'15'	[illegible]	[illegible]		+6'30'	5'25'	+5'55'

MAGNITUDE OF FIXATION DISPARITY

SUBJECT: [illegible]   NO: 12

4.25m   Fxd.   Fxd.'   Fxd."

	Fxd. R	Fxd. L	Fxd.' R	Fxd.' L	Fxd." R	Fxd." L
1	1'16"	38"	38"	+38"	38"	+38"
2	1'16	0	38"	0	1'16"	0
3	[illegible]	[illegible]	38"	0	1'16"	0
4	0	[illegible]	1'16"	0	1'54"	+38"
5	1'16'	+16'	38"	+38"	38"	+38'
	Ave: [illegible]	Ave: 38' exo	Ave: 46 exo	Ave: 15" exo	Ave: 1'8" exo	Ave: 23" exo
	Mean: 12 exo		Mean: 31" exo		Mean: 46" exo	

40cm.

	R	L	R	L	R	L
1	1'5"	2'10"	1'5"	2'10"	+2'10"	+1'5"
2	0	2'10"	0	1'5"	+2'10"	+2'10"
3	1'5"	2'10	1'5"	0	+3'15	+1'5"
4		0	0	[illegible]	+2'10	[illegible]
5	1'5"	2'10"	+1'5"	1'5"	+2'10"	0
	Ave: [illegible] exo	Ave: [illegible]	Ave: 13" exo	Ave: 52" exo	Ave: [illegible]	Ave: [illegible]
	Mean: [illegible]		Mean: 33" exo		Mean: 39 exo	

20cm.

	R	L	R	L	R	L
1	0	+2 [illegible]	+1'18	+1'44"	0	0
2	0	+2'10'	0	+1'18"	0	0
3	0	+2'10	0	+1'44"	+2'10"	+2'10"
4	0	[illegible]	26"	+[illegible]	0	+2'10"
5	0	+4'20	[illegible]	+52"	0	0
	Ave: 0	Ave: [illegible] exo	Ave: 5 exo	Ave: 12 exo	Ave: 26" exo	Ave: 52" exo
	Mean: 1'5" exo		Mean: 29" exo		Mean: 13" exo	

CURVES DUE TO INDUCED PRISM AT 4 25 M

SUBJECT: G. L.   NO: 12

B = Blur   Bl.O = Blur Out   D = Diplopia   E.V. = Extremely Variable

I.D. = Intermittent Diplopia   J = Numbers jumping in and out of focus

N.M. = Numbers moving   V = Variable

Base-Out Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\overline{X}$	1 Week After Training (Fxd') R	L	X	6 Weeks After Training (Fxd") R	L	$\overline{X}$
4	2'32	0	-1'16"	1'54"	+[illegible]	[illegible]	3'10"	[illegible]	-2'5[illegible]"
8	[illegible]	+38'	-1'[illegible]	[illegible]	+2'[illegible]	-2'[illegible]	[illegible]	+2'3[illegible]	-2'5[illegible]
12	[illegible]	+4'46"	-5[illegible]	3'48"	+1'[illegible]	-2'32"	3'10"	[illegible]	[illegible]
16	5'42	+2'32"	[illegible]	[illegible]	+3'4[illegible]	-5'4[illegible]"	5'47"	[illegible]	-5'4[illegible]
20	5'[illegible]	[illegible]	-4'[illegible]	5'4'	+3'[illegible]	-4'7"	7'[illegible]	+1'56"	[illegible]
24	[illegible]	+3'46'	[illegible]	5'42'	+3'[illegible]	[illegible]	8'24	+10'8'	-9'11"
28	[illegible]	8		6'20'	[illegible]	[illegible]	10'8"	+10'5'	-10'8'
32				[illegible]10'	+4'2[illegible]	[illegible]	10'8	-11'24	-1[illegible]'48"
36				13'1[illegible]	+10'8	-12'40	8'14"	+10'40"	-9'30"
40				9[illegible]	8[illegible]		13'56'	+10'8"	12'2"

Base-In Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\overline{X}$	1 Week After Training (Fxd') R	L	$\overline{X}$	6 Weeks After Training (Fxd") R	L	$\overline{X}$
2	38"	1'[illegible]	+38"	+58"	1'[illegible]	+57"	0	0	0
4	+11'24"	10'8"	+10'4[illegible]	+5'4"	6'20'	+5'42"	+7'36"	4'7"	+[illegible]
6	8[illegible] 0	8[illegible]		+2[illegible]	22'[illegible]	+2[illegible]"	+[illegible]'27	17'[illegible]" N.M.	+1[illegible]
8				ID	ID		I[illegible]	ID	
10									
12									
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 4.25M

SUBJECT: B.C. NO: 12

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
+0.50	+2'30"	2'32'	+2'31'	38'	38'	0	0	0	0
+1.00	[illegible]	[illegible]		[illegible]	[illegible]				
+1.50									
+2.00									
+2.50									

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
-0.50	+5'4'	6'30'	+5'42'	0	1'1[illegible]	+38'	+3'10"	3'10"	+3'10"
-1.00	+15'12'	15'12	+15'12	+4'21"	[illegible]	+4'45'	+8'14"	10'8	+9'11"
-1.50	B.O.	N.M.		+9'54"	9'30'	+9'12'	+9'30	15'18"	+11'24
-2.00				+10'8"	[illegible]	+11'24	+12'40"	20'2[illegible]	+16'22
-2.50				+10'6	12'45	[illegible]	N.M.	N.M.	

CURVES DUE TO INDUCED PRISM AT 40cm

SUBJECT: [illegible] NO: 1

B = Blur BI.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity: Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
4	39"	+5"	+13"	5'15	[illegible]	[illegible]	+1'5"	-1'5	0
8	4'20"	+1'5"	-2'43"	[illegible]	[illegible]	-4'20	0	0	0
12	8'40	+1'30	-7'35"	[illegible]	-5	-6'30	2'10"	+1	-1'38"
16	15'10	+10'50	-13'	3'45	[illegible]	[illegible]	2'10"	[illegible]	-3'48"
20	20'35	[illegible]	-18'25"	9'45	+7'	-8'45	2'10	+5'25	-3'48"
24	26' V	-19' V	+22'45'	11'35 B	+13'	-12'26	5'25"	+5'25	-5'25"
28	[illegible]	+21'4	[illegible]	BI.O	BI.O		10'50	[illegible]	-9'15"
32	D V	D V					BI.O	B	
36									
40									

Base-In Prism	Magnitude of Fixation Disparity: Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
2	+1	2'16"	+1'38"	+1'5"	1'5"	+1'5"	+2'10"	2'10	+2'10"
4	+1'5'	3'15"	+2'10"	+2'10"	2'10"	+2'10"	+3'15"	4'20	+3'48"
6	+3'15"	5'25"	+4'20	+2'10"	1'5"	+1'38	+4'20"	4'20"	+4'20"
8	+5'25"	4'20"	+4'53"	+4'20"	3'15"	+3'48"	+5'25"	6'30'	+5'58"
10	+8'40"	10'30'	+9'45"	+4'20"	3'15"	+3'48"	+8'40"	7'35	+8'8"
12	+14'5"	17'20"	+15'43"	+7'35	6'30"	+7'3"	+11'55"	10'50"	+11'23
14	D	D		+10'50" B	9'45" B	+10'18"	+10'50"	13'	+11'55'
16				+11'55'	14'5"	+13'	+15'10	14'5"	+14'38'
18				+14'5"	15'10"	+14'38"	I.D	I.D	
20				BI.O	BI.O				
22									

CURVES DUE TO INDUCED LENSES AT 40cm

SUBJECT: [illegible] NO: 1 B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\overline{X}$	R	L	$\overline{X}$	R	L	$\overline{X}$
+0.50	1'5'	+1'5"	-1'5'	0	1'5'	-25'	+1'5'	D	+35
+1.00	[illegible]	-2'1	[illegible]	[illegible]	[illegible]	-1'35"	1'5"	-2'	-1'38'
+1.50	[illegible]	[illegible]	+1'28'	+2	[illegible]	[illegible]	[illegible]	[illegible]	-1'38'
+2.00	[illegible]	[illegible]	-4	[illegible]	-3'40	[illegible]	[illegible]	-4	-2'45"
+2.50	[illegible]	+14'0"	-13'22	[illegible]	[illegible]	[illegible]	5'25'	[illegible]	[illegible]

Minus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\overline{X}$	R	L	$\overline{X}$	R	L	$\overline{X}$
-0.50	+1'5"	1'5"	+1'5'	+1'5"	5'	[illegible]	+3'15"	2'50	+2'45"
-1.00	[illegible]	4'20'	+3'25'	+4'45"	4'20	+4	+4'20'	4'70'	-4'20'
-1.50	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	+4'25'	+8'45"	3'35'	+8'15"
-2.00	10'50"	13'	+11'35	+7'15'	5'15	+7	+13'	11'58"	+11'55
-2.50	D	I.D		+2'	1'55	+12'55	[illegible]	[illegible]	

MAGNITUDE OF FIXATION DISPARITY

SUBJECT: A.S. NO: 13

4.25m

	Fxd. R	Fxd. L	Fxd.' R	Fxd.' L	Fxd." R	Fxd." L
1	+2'32"	3'48"	1'16"	38"	+38"	0
2	+1'54"	3'43"	0	1'16"	+38"	38"
3	[illegible]	[illegible]	0	1'54"	0	1'16"
4	[illegible]	5'4"	+1'16"	[illegible]	0	38"
5	+1'16"	3'10"	[illegible]	2'32"	+1'16"	1'54"
	Ave: 2'9" eso	Ave: 4'[illegible]	Ave: 8" eso	Ave: 1'46" eso	Ave: 30" eso	Ave: 53" eso
	Mean: 3'10" eso		Mean: 49" eso		Mean: 42" eso	

40cm.

	R	L	R	L	R	L
1	16'15"	+26'	0	+3'15"	1'5"	+2'[illegible]
2	18'25"	+26'	1'5"	+2'10"	1'5"	+4'20"
3	21'40"	+29'15"	0	+2'[illegible]	[illegible]15"	+1'5"
4	23'50'	[illegible]	0	[illegible]	1'5"	+1'5"
5	22'45"	+23'50"	2'10"	+4'20"	1'5"	+2'10"
	Ave: [illegible]	Ave: [illegible]	Ave: 39" exo	Ave: 2'49" exo	Ave: 1'31" exo	Ave: 2'10" exo
	Mean: [illegible]		Mean: 1'44" exo		Mean: 1'51" exo	

20cm.

	R	L	R	L	R	L
1	16'50"	+8'40"	+2'10"	[illegible]	0	0
2	19'30"	+15'[illegible]	1'10"	+2[illegible]	0	0
3	19'30"	[illegible]	[illegible]	0	2'10"	1'5"
4	[illegible]	[illegible]	[illegible]	0	0	[illegible]
5	[illegible]	[illegible]	[illegible]	2'10"	1'5"	0
	Ave: 16'54" exo	Ave: 13'52" exo	Ave: 52" exo	Ave: 26" eso	Ave: [illegible]	Ave: [illegible]
	Mean: 15'23" exo		Mean: 13" exo		Mean: [illegible]	

CURVES DUE TO INDUCED PRISM AT 4 25A

SUBJECT: A S.　　NO: 12

B = Blur　Bl.O = Blur Out　D = Diplopia　E.V. = Extremely Variable

I.D. = Intermittent Diplopia　J = Numbers jumping in and out of focus

N.M. = Numbers moving　V = Variable

Base-Out Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
4	3'46" N.M.	0	-1'54"	1'16"	56	-1'3"	1'16"	0	-38"
8	5'4"	+1'16	-3'10'	2'32"	0	-1'16"	1'54'	+58"	-1'16"
12	[illegible]	[illegible]		[illegible]	[illegible]	-3'	[illegible]	[illegible]	-3'46'
16				1'54	[illegible]	[illegible]	[illegible]	[illegible]	-6'20'
20				5'[illegible]	+1'54	[illegible]	10'46	[illegible]	-8'52"
24				5'[illegible]	+1'[illegible]	[illegible]'10'	12'2"	+5'[illegible]	-8'33
28				7	+5'4"	-6'30'	13'56	[illegible]	12'[illegible]
32				10'8	+9'30"	-8'54	V	V	
36				Bl.O	Bl.O				
40									

Base-In Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
2	+10'8"	15'2'	+17'56'	+5'4	5'42"	+5'23'	+3'48	6'56'	+5'22
4	+20'16" N.M.	24'[illegible]	[illegible]	+5'4'	6'58	+6'1"	+8'14'	10'6'	+9'[illegible]
6	D	D		+[illegible]'24	38'	+[illegible]'12'	I.D.	I.D.	
8				I.D.	I.D.				
10									
12									
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 4.25 M

SUBJECT: A.S.   NO: 13

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	X̄	R	L	X̄	R	L	X̄
+0.50	+5'4" N.M.	8'56	+6'50'	+3'20'	3'46	+3'39'	+5'4'	[illegible]	+5'23
+1.00	Bl.O	Bl.O		Bl	Bl.O		[illegible]	[illegible]	
+1.50									
+2.00									
+2.50									

Minus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	X̄	R	L	X̄	R	L	X̄
-0.50	+2'32" N.M.	8'52'	+5'42'	+4'58"	8'14'	+7'56	+7'3'	10'8"	+8'52'
-1.00	Bl.O	Bl.O		[illegible]	Bl.O		Bl.O	Bl.O	
-1.50									
-2.00									
-2.50									

CURVES DUE TO INDUCED PRISM AT 40 cm

SUBJECT: A[illegible]   NO: 1"

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\overline{X}$	1 Week After Training (Fxd') R	L	$\overline{X}$	6 Weeks After Training (Fxd") R	L	$\overline{X}$
4	27'5'	-23'[illegible]	[illegible]	5'[illegible]	+8'4'	[illegible]	10'30		-8'8'
8	29'[illegible]	[illegible]	-27'[illegible]	[illegible]	+11'5	-1'[illegible]	[illegible]	15'	-13'[illegible]
12	N[illegible]	-7		1'15	-18'25	-17'20'	[illegible]'25	+17	-15'[illegible]
16				1'25	[illegible]	[illegible]'47	[illegible]	+19'30'	-20'[illegible]
20				1[illegible]'3	-14	[illegible]'10'	N.M.	N.M.	
24				21'[illegible]	+22'[illegible]	-12'12'			
28				B[illegible]	BO				
32									
36									
40									

Base-In Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\overline{X}$	1 Week After Training (Fxd') R	L	$\overline{X}$	6 Weeks After Training (Fxd") R	L	$\overline{X}$
2	1'[illegible]	+10'15'	-10'4[illegible]	1'5'	+[illegible]	-1'3[illegible]	+2'10	-[illegible]	+2'[illegible]
4	16'15	+10'50'	-13'[illegible]	+1'5"	2'10'	+1'[illegible]	+3'15'	[illegible]	+[illegible]
6	9'45'	+9'4[illegible]	-9'45'	+3'[illegible]	4'20"	+[illegible]'47'	+4'20	[illegible]	-4'[illegible]
8	5'26'	-2'1	-3'43"	+5'25"	[illegible]32"	+5'57"	+8'45"	10'50"	+9'45"
10	2'10'	2'10	0	+8'40"	10'50"	+9'45"	+8'[illegible]	10'	+9'45'
12	+3'15	5'25"	+4'20"	+8'40'	9'45'	+9'32"	+9'[illegible]5	11'25	+10'[illegible]
14	+2'10'	5'25"	+3'48'	[illegible]15'	16'15	+14'37'	+1[illegible]	10'50	+10'50
16	+16'15"	16'25"	+16'15"	+15'10'	17'20	+1[illegible]'15"	+10'5[illegible]	[illegible]	+12'28
18	N.M.	N.M.		N.M.	N.M.		N.M.	N.M.	
20									
22									

CURVES DUE TO INDUCED LENSES AT 40 cm

SUBJECT: A.S. NO: 13

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
+0.50	[illegible]	[illegible]	[illegible]	10'50"	+15'	-13'	9'45"	+10'57"	+10'18"
+1.00	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	
+1.50									
+2.00									
+2.50									

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
-0.50	3'15"	+5'25'	+4'20'	[illegible]	7'35"	+5'52'	+10'58'	8'46'	[illegible]
-1.00	+8'40"	6'30'	+7'35'	[illegible]	18'25'	+16'48'	+16'15"	18'25"	[illegible]
-1.50	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	
-2.00									
-2.50									

MAGNITUDE OF FIXATION DISPARITY

SUBJECT: H F **NO:** 14

4.25m

	Fxd. R	Fxd. L	Fxd.' R	Fxd.' L	Fxd." R	Fxd." L
1	3'10"	+1'54"	2'32"	+1'54"	38"	+38
2	4'26"	+3'10"	2'32"	+1'16	1'16"	+1'16"
3	[illegible]	[illegible]	[illegible]	0	1'54"	0
4	2'32"	+1'16	2 32"	-1'16"	2'[illegible]	+38
5	4'26"	+1 1[illegible]	2'32"	+38"	2'10"	0
	Ave: 3'19" exo	Ave: 1'39" exo	Ave: 1'47" exo	Ave: 1'1" exo	Ave: 1'38" exo	Ave: 30" exo
	Mean: 2'34" exo		Mean: 1'54" exo		Mean: 1'4" exo	

40cm.

	R	L	R	L	R	L
1	9'45"	+9'45"	0	+3'15"	2'10"	+5'25"
2	9'45"	+11'55"	1'5"	0	1'5"	+3'15"
3	8'40"	+7'35	0	+ 5"	5'15"	+5'25"
4	9'45"	[illegible]	0	0	[illegible]	[illegible]
5	9'45"	+5'25"	0	+1'5	2'10"	+3'15"
	Ave: 9'32" exo	Ave: 8'40" exo	Ave: 13" exo	Ave: 53 exo	Ave: 1'57" exo	Ave: 4'44" exo
	Mean: 9'6 exo		Mean: 33 exo		Mean: 5'22" exo	

20cm.

	R	L	R	L	R	L
1	7'48"	-[illegible]	2'10"	+4'20"	2'10"	+5'25"
2	8'40"	+6'30"	1'18"	+5'38"	3'15"	+5'25"
3	4'20"	[illegible]	4'30"	+6'[illegible]	4'20"	+5'25"
4	[illegible]	[illegible]		+3[illegible]	[illegible]	+5'[illegible]
5	7'48"	+5'38"			[illegible]	[illegible]
	Ave: 7'48" exo	Ave: 7'32" exo	Ave:	Ave:	Ave: 3'15" exo	Ave: 5'25" exo
	Mean: 7'40" exo		Mean: 4'11" exo		Mean: 4'20" exo	

CURVES DUE TO INDUCED PRISM AT 4.25 M

SUBJECT: H.F. **NO:** 14

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
4	6'20"	[illegible]	-6'20"	2'32"	+1'16	-1'54"	3'12"	[illegible]	[illegible]
8	10'8"	[illegible]	-7'[illegible]	2'[illegible]"	+[illegible]	-1'54"	3'[illegible]	[illegible]	-4'46"
12	10'8	-5'4	-7'36	4'[illegible]	+3'[illegible]	5'[illegible]	[illegible]	+4'41"	-5'28
16	12'[illegible]	+4'42'	-8'53	5	-5'[illegible]	-4'7"	Bl.O	Bl.O	
20	12'2'	+6'20'	-3'11	6'18"	+3'48	-2'23			
24	Bl.O	Bl.O		Bl.O	Bl.O				
28									
32									
36									
40									

Base-In Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
2	38'	1'54"	+38	0	1'16"	+38"	+38"	38'	+38'
4	+38"	2'32'	+1'36"	+1'54"	3'10"	+2'32	+2'52"	3'26'	+2'51'
6	+7'36'	10'44'	+9'11	12'2"	12'40"	+12'21	+6'20	5'4[illegible]	+5'42"
8	N.M.	N.M.		E.D	E.D		E.D	E.D	
10									
12									
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 4.25

SUBJECT: B.F. NO: 14

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
+0.50	+3'12"	[illegible]	+38"	1'16"	0	- [illegible]"	3'40"	[illegible]	-4'7"
+1.00	BO	BO		BO	BO		[illegible]48'	[illegible]	-4'45"
+1.50							[illegible]	+5'4"	[illegible]23
+2.00							[illegible]	BO	
+2.50									

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
-0.50	38"	0	-19"	+1'16"	1'54"	+1'35"	+1'54"	0	+57"
-1.00	BO	BO		[illegible]	5'42"	-5'[illegible]	+3'10"	2'3[illegible]"	+2'51"
-1.50				+7'[illegible]	10'46"	+10'8"	+3'[illegible]	3'[illegible]	-3'10"
-2.00				BO	BO		+3'48"	4'20"	+4'[illegible]
-2.50							+9'36"	8'52"	+8'14"

CURVES DUE TO INDUCED PRISM AT 40cm

SUBJECT: [illegible] NO: [illegible]

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving ; V = Variable

Base-Out Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
4	9'45'	+11'55	-10'50'	3'15'	+2'	-2'45	6'35'	[illegible]	-6'50'
8	11'55	+10'30	+11'7'	4'30'	+3'	-'45'	8'40	-'	-7'35'
12	14	+13'15	-15'20	5 [illegible]	+7'5'	[illegible]	15'	+9'	-8'4
16	18'25'	+20'45' ✓	-17'	6'	+6'	-6'30'	15'	14	-15'25'
20	22'[illegible]	+26'	-24'35	1	+11'5	-10'	5'10'	+17'2	-16'25
24	24'[illegible]	+26'	-25'25	B	B		21'4	27'75	-24'25'
28	B	B.O					B.O	B	
32									
36									
40									

Base-In Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
2	+4'20'	+2'10'	-3'15'	+2'10'	1'5'	+1'30'	+2'10'	+2'10	0
4	1'5'	5'15'	+2'10'	+4'20'	2'10'	+3'45'	0	1'5'	+35'
6	5'25'	'5'	+5'15'	+[illegible]'50'	5'45'	+5'58'	-2'10	1'5	+[illegible]
8	+9'45'	8'45'	+9'15'	+10'50'	11'55'	+11'25'	B.O	B.O	
10	+9'45'	13'	+11'25	B.O	B.O				
12	-13'	18'25'	+15'45'						
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 40cm

SUBJECT: [illegible] NO: [illegible]

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	X	6 Weeks After Training (Fxd") R	L	X
+0.50	[illegible]	[illegible]	[illegible]	0	-3	-1'38'	5'25"	[illegible]	-5'45
+1.00	[illegible]	[illegible]	[illegible]	[illegible]	0	[illegible]	[illegible]	[illegible]	-4'55
+1.50	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5'25"	[illegible]	[illegible]
+2.00	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
+2.50	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]	[illegible]	[illegible]

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
-0.50	2'10'	+2'10'	[illegible]	0	1'	[illegible]	1'5'	2'25'	[illegible]
-1.00	[illegible]	[illegible]	[illegible]	[illegible]	5'15'	[illegible]	1'	1'	[illegible]
-1.50	+3'15	5'25	+4'20'	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
-2.00	[illegible]	[illegible]	[illegible]	[illegible]	10'50'	+11'55	[illegible]	[illegible]	
-2.50	N.M.	N.M.		+20'45'	[illegible]	[illegible]			

MAGNITUDE OF FIXATION DISPARITY

SUBJECT: J.M. NO: 15

4.25m Fxd. Fxd.' Fxd.''

	R	L	R	L	R	L
1	+38''	2'32''	0	1'16''	0	1'16''
2	0	1'54'	0	2'32''	+38''	1'16''
3	+38''	2'32''	+1'54''	[illegible]	38''	1'54''
4	+38''	2'32''	+1'16	1'54''	0	1'54''
5	+38	2'45''	+1'16''	2'32''	+38''	2'32''
	Ave: 30''eso	Ave: 2'45''eso	Ave: 53''eso	Ave: [illegible]	Ave: 8''eso	Ave: 1'46''eso
	Mean: 1'35''eso		Mean: 1'31''eso		Mean: 57''eso	

40cm.

	R/L	R/L	R	L	R	L
1	+2'10''/3'15''	+3'15''/2'10''	+3'15''	3'15''	+1'5''	0
2	+1'5''/2'10''	+2'10''/[illegible]'15''	+3'15''	4'20'	+2'10''	1'5''
3	+1'5''/3'15''	[illegible]/2'10''	+3'15''	2'10'	+2'10	+'5''
4	[illegible]	[illegible]	+3'15''	3'15''	[illegible]	[illegible]
5	+1'5''/2'10''	[illegible]/3'15''	+3'15''	3'15''	+1'5''	0
	Ave: [illegible]	Ave: [illegible]	Ave: [illegible]	Ave: 3'15''eso	Ave: 1'57''[illegible]	Ave: 26''[illegible]
	Mean: (2'16''/3'24''eso) 2'50'' eso		Mean: 3'15''eso		Mean: 1'12 eso	

20cm.

	R	L	R	L	R	L
1	+3'28'	[illegible]	+3'2''	2'10''	+2'10''	+2'10'
2	+2'10''	2'[illegible]	+3'28''	1'18''	0	+2'10''
3	+2[illegible]	1'18''	0	0	0	+4'20''
4	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
5	[illegible]	[illegible]	0	0	0	[illegible]
	Ave: [illegible]'26''eso	Ave: 2'20''eso	Ave: 1'18 eso	Ave: 57''eso	Ave: 52''eso	Ave: 3'2 [illegible]
	Mean: 2'13''eso		Mean: 1'6''eso		Mean: 1'5 eso	

CURVES DUE TO INDUCED PRISM AT 4.25 M

SUBJECT: J.M. NO: 1

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
4	1'54		-57	[illegible]	+33	-1'	0	[illegible]	+19'
8	[illegible]	3	-1'5	0	+5	-5	0		0
12	1'10	[illegible]	-2'13	[illegible]	+38	-19'	2'32"	[illegible]	-154
16	8'52	10'26'	[illegible]	[illegible]	[illegible]	-19	3'46"	[illegible]	-2'32
20	[illegible]	[illegible]		[illegible]	0	[illegible]	1'54	0	-57
24				[illegible]	0	-57'	[illegible]	0	[illegible]
28				[illegible]	[illegible]		[illegible]	[illegible]	
32									
36									
40									

Base-In Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
2	+2'32'	4'24	+3'25'	+2'32'	[illegible]	+2'32"	+2'32'	[illegible]	+2'[illegible]
4	+8'52"	[illegible]	+10'2[illegible]	5'4"	6'4"	[illegible]	+5'4	3'48'	+4'[illegible]
6	14'34	13'[illegible]	+14'28'	+7'[illegible]	[illegible]	+8'14"	[illegible]	[illegible]	+6'14
8	+20'14"	23'26'	+21'[illegible]	+19'2"	10'28"	+15'45'	+15'50	14'[illegible]	+10'[illegible]
10	D	D		3'[illegible]	V	—	I.D.	I.D.	
12									
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT [illegible]

SUBJECT: [illegible] NO: [illegible] B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity									Minus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")				Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	X	R	L	X		R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
+0.50	0	3'30'	+1'29"	+2	2 32	+1'25'	30	1 34	+1'1[illegible]	-0.50	1 5 4'	6'58"	+6.1	+3'46"	4'26"	+4'7	+[illegible] 2'	1 10	+2 51'
+1.00	Bl.O	Bl.O			Bl.O		[illegible]	Bl.O		-1.00	+5'42"	8'14'	+6'58	+8'52"	8'52"	+8'52	+5'42'	7 16"	+[illegible]
+1.50										-1.50	+11 24	12 2	+11'47"	+8'52'	10'8"	+9'30"	+6'58"	9 33"	+8 14
+2.00										-2.00	+17'44	19'28"	+18'4.	+11 24'	13'56"	+12 40	+13'56"	10'4"	-12'21"
+2.50										-2.50	Bl.O	Bl.O		+35'28	38'	+36'44"	+20'16'	22'46"	+21'32

CURVES DUE TO INDUCED PRISM AT 40 cm

SUBJECT: J.M. NO: _

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity: Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
4	+1' [illegible]	0	+33"	+2'1	+2	0	+1'5'	1'	+1'5"
8	2'1	+1'3	-1'52"	0	1'5"	+33"	0	0	0
12	2	-2'10	[illegible]	+1'3'	+3	-1'5"	1	0	-33
16	[illegible]	[illegible]	[illegible]	[illegible]15	[illegible]	-4'53"	[illegible]	+2'10'	-2'10"
20	[illegible]	[illegible]	[illegible]	4	[illegible]	[illegible]	[illegible]	+5'15'	-3'15"
24	[illegible]	[illegible]		[illegible]	+7	[illegible]	+10'	+6'30'	-5'25"
28	[illegible]	[illegible]			+5'25"	[illegible]	[illegible]20'	[illegible]	-5'58'
32	27'5	[illegible]		[illegible]30"	-8'[illegible]	-4'35'	9'45'	[illegible]	-7'3"
36				D numbers too small to read			8'40"	+9 [illegible]	-9'33"
40							Numbers too small to read		

Base-In Prism	Magnitude of Fixation Disparity: Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
2	+3'15"	4'20	+3'48'	+5'25'	5'25'	+5'25"	+4'20	3'15"	+3'18'
4	+5'25'	5'51'	+5'38"	+8'40"	7'35"	+8'8'	+6'30	4'10"	+5'25"
6	+9'43'	7'30'	+8'4[illegible]	+10'50'	8'40"	+9'45'	+7'[illegible]	4'20"	+5'58'
8	10'50'	14'5	+12'28'	+11'55'	7'35"	+9'45'	+7'55	5'25"	+6'30
10	+15'50'	17'10	+16'15'	+9'45'	9'45'	+9'45"	+9'45'	5'25	+9'35'
12	+27'5 8	26 8	+26'35"	[illegible]	16'15"	+15'20"	+9'45	9'45"	+9'45"
14	+30'20'	28'10"	+29'15'	[illegible]	N.M.		+10'50"	11'55	+11'25
16	ID	ID					+18'25'	21'40"	+20'3"
18							ID	ID	
20									
22									

CURVES DUE TO INDUCED LENSES AT 40cm

SUBJECT: J.M. NO: 15

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
+0.50	+4'20	+4'2[illegible]	+4'20'	+5'[illegible]	5'[illegible]	+3'1	+3'15"	[illegible]	+7'15'
+1.00	-2'5	15'	+2	0	0	0	+3'15"	+1[illegible]	+1'5'
+1.50	-1'5'	1'5"	+1'5'	0	0	0	+1'5'	[illegible]	-3'5'
+2.00	0	0	0	1'[illegible]	+1'5	+1'5"	1'5	+[illegible]	-1'38'
+2.50	1'5' [illegible]	1'5 [illegible]	+1'5	[illegible]	+2'40' [illegible]	-2'15"	1'5'	+2'	-1'38'

Minus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
-0.50	+9'45'	11'55"	+10'50"	+5'35"	6'50"	+5'48'	+4'45	4'20'	+7'3'
-1.00	+8'43'	10'50"	+9'45"	+[illegible]	8'40"	+8'45'	-5'35	6'35	+5'58"
-1.50	10'50'	11'35'	+11'35'	+11'35'	10'50	+11'23'	+[illegible]	8'40"	+9'13'
-2.00	+11'55'	14'5'	+15'	+14'5"	13'	+13'43'	+12'55'	1[illegible]	+12'28
-2.50	Bl.O	Bl.O		Bl.O	Bl.O		Bl.O	Bl.O	

MAGNITUDE OF FIXATION DISPARITY

SUBJECT: M.W.　　NO: 16

4.25m　Fxd.　　Fxd.'　　Fxd."

	R	L	R	L	R	L
1	1'16"	1'16"	0	38"	1'16"	38"
2	+38"	1'16"	+38"	38"	38"	38"
3	+38"	2'32"	+1'16"	1'16"	38"	38"
4	[illegible]	1'1	[illegible]	1'16"	0	38"
5	+1'16"	1'16"	0	38"	0	0
	Ave: 23" eso	Ave: 1'31 eso	Ave: 38" eso	Ave: 53" eso	Ave: 30" exo	Ave: 30" eso
	Mean: [illegible]" eso		Mean: 46" eso		Mean: 0	

40cm.

	R	L	R	L	R	L
1	2'10"	0	0	1'5"	0	0
2	2'10"	-2'10	1'5"	1'5"	0	0
3	3'15"	[illegible]	+1'5"	2'10" —	0	0
4	5'25	-4'20"	0	[illegible]	2'10"	+1'5"
5	7'35"	+6'30"	0	[illegible]	0	0
	Ave: 4'7"	Ave: [illegible] eso	Ave: 0	Ave: 52" eso	Ave: 26" exo	Ave: 13" exo
	Mean: 4'19" exo		Mean: 26" eso		Mean: 20" exo	

20cm.

	R	L	R	L	R	L
1	[illegible]	+2'10	2'10"	+2'10"	0	0
2	[illegible]	+4'20"	2'10"	+2'10"	2'10"	0
3	2'1	[illegible]	1'18"	+2'10	2'10"	0
4	4'44	[illegible]	3'2"	+4'20"	[illegible]	0
5	5'50"	[illegible]	2'10	[illegible]	3'10	0
	Ave: 4'8" exo	Ave: [illegible] exo	Ave: 2'10" exo	Ave: 3'2" exo	Ave: 1'18" exo	Ave: 0
	Mean: 5'25" exo		Mean: 2'36" exo		Mean: 39" exo	

CURVES DUE TO INDUCED PRISM AT 4.25 M

SUBJECT: M. R.   NO: 1

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
4	1'54"	0	-57"	1'16"	[illegible]	-1'26"	1'16"	[illegible]	-38'
8	1'54"	0	-57"	3'10"	[illegible]	[illegible]	1'16"	0	-38'
12	6'20"	+7'36'	-6'58'	[illegible]	[illegible]	[illegible]	1'59"	[illegible]	-1'5[illegible]
16	8'52	+5'4'	-6'58'	5'4	+3'10	-4'[illegible]	-[illegible]	+1'16"	-1'54"
20	12'[illegible]	[illegible]	-12'21	7'[illegible]	+3'[illegible]	[illegible]	5'4	+3'46"	-4'20'
24	E.V.	E.V.		8'34'	+5'4	-6'39'	5'52"	+6'58"	-2'53"
28				I.D.	I.D.		E.V.	E	
32									
36									
40									

Base-In Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
2	+1'54	3'10	+2'3[illegible]	+1'54	1'16"	+1'35"	+38'	2'54"	+1'1[illegible]
4	7'36'	8'52"	+8'14"	7'36	8'52"	+8'14"	+5'42	5'36'	+6'39
6	D	D		D	D		I.D.	I.D.	
8									
10									
12									
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 4 23 74

SUBJECT: M.W. NO: 16

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
+0.50	+38"	1'54"	+1'16"	0	38"	+19"	0	38	+19"
+1.00	1'16'	38'	-35	0	38	+19"	+38"	0	+38"
+1.50	Bl.O	Bl.O		Bl.O	Bl.O		Bl.O	Bl.O	
+2.00									
+2.50									

Minus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
-0.50	+4'36"	9'30'	+6'33'	[illegible]	[illegible]	+5'42"	+3'10'	3'48"	+3'29'
-1.00	+3'14"	8'52	+5'33'	+8'32"	10'46'	+9'44'	+3'10"	4 2"	+3'48'
-1.50	+17'49	20'1[illegible]	+19'	+8'32"	11 24'	+10'8"	+10 6"	8'14	+9'11
-2.00	-22'48	25'20'	+24'4	+11 24'	11 24	+11 24	+8'52"	11'24"	+10'8"
-2.50	J	J		+7 12" V	15 12' V	+15'12	+10 8 V	12 2"	+11'5"

CURVES DUE TO INDUCED PRISM AT 40 cm

SUBJECT: M W   NO: 16

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\overline{X}$	R	L	$\overline{X}$	R	L	$\overline{X}$
4	8'40"	+6'30"	-7'35"	4'20"	+5'[illegible]	-4'53"	15"	+2'10"	1'38"
8	15'10"	+11'55"	-13'33"	6'30"	+7'35"	-7'3"	2'10"	+3'[illegible]	-2'43"
12	21'[illegible] V	-18'[illegible]	-20'3"	[illegible] 5	+8'40"	-10'8"	5'25"	+4'20"	-4'53"
16	24'55"	+19'30"	-27'13"	11'55"	+8'42"	-10'18	6'30"	+[illegible]	-6'30"
20	28'10"	+32'30"	-30'20"	14'5"	19'45"	-11'55"	9'45"	+9	-9'45"
24	I.D	I.D		18'25	+14'5	-16'15"	10'50"	+11'35"	-11'23"
28				✓ Numbers too small to read			E.V.	N.M.	
32									
36									
40									

Base-In Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\overline{X}$	R	L	$\overline{X}$	R	L	$\overline{X}$
2	+1'5"	3'28"	+2'17"	+2'10"	0	+1'5"	+2'10"	0	+1'5"
4	+3'15"	5'25	-4'20"	0	1'5"	+33"	+3'15"	1'5'	+2'10"
6	+4'20"	6'30"	+5'25	+5'5"	5'25"	+4'20"	+4'20	4'20"	+4'20"
8	+19'30"	22'45"	+21'8'	+5'25"	9'45"	+7'35"	+5'25"	8'40	+7'3"
10	+21'40" B	24'5' B	+24'23"	+10'50"	13"	+11'55"	+5'25"	10'50"	+8'8"
12	D	D.		+10'50"	18'25"	+14'38"	+8'40"	13'	+10'50"
14				+15'10"	21'40"	+18'25"	+10'50"	16'15"	+13'33"
16				ID	ID		D	D	
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT [illegible]

SUBJECT: [illegible]   NO: [illegible]

B = Blur   Bl.O = Blur Out   D = Diplopia   E.V. = Extremely Variable

I.D. = Intermittent Diplopia   J = Numbers jumping in and out of focus

N.M. = Numbers moving   V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
+0.50	5'15"	+1'5'	-2 10'	[illegible]	[illegible]	-1 5'	1'5'	[illegible]	-1'5'
+1.00	[illegible]	[illegible]	-9'45"	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
+1.50	[illegible]	[illegible]	[illegible]	[illegible]	+5'25'	-5'58"	3'15'	[illegible]	-2'43
+2.00	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-8 8'	[illegible]	[illegible]	[illegible]
+2.50	[illegible]	[illegible]	[illegible]	[illegible]	-8'4'	[illegible]	[illegible]	[illegible]	-5'58"

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
-0.50	+3'15"	3'15"	+3'15	0	[illegible]	+1'38"	+1'5'	1'5'	+1'5"
-1.00	+3'15"	3'15'	+3'15"	+3'15'	3 15"	+3'15	[illegible]	[illegible]	[illegible]
-1.50	+5'25'	9'45'	[illegible]	[illegible]	[illegible] 25"	[illegible]	[illegible] 25"	4'25'	+4'57
-2.00	+7'35"	9'4	+8'40'	[illegible]	8'40'	-8'8"	-4'20'	4'20	+4 20'
-2.50	+10'50"	15 [illegible]	13	+7'35'	8'40"	+8'8"	[illegible]	[illegible]	

MAGNITUDE OF FIXATION DISPARITY

SUBJECT: J.L. NO: 17

4.25m

	Fxd. R	Fxd. L	Fxd.' R	Fxd.' L	Fxd." R	Fxd." L
1	5'4"	+3'10'	3'10"	+1'16"	1'54"	+38"
2	5'42"	+4 26	3'48"	+1'54"	3'10"	+38"
3	[illegible]	+1'54	3 48	[illegible]	4'26"	+1'16"
4	[illegible]	+2'32"	5'4"	+2'2"	3'10"	+1'16"
5	5'4"	2'32"	[illegible]	2'32"	3'48"	+38"
	Ave: 5'12" exo	Ave: 2'55 exo	Ave: 4'11" exo	Ave: 2'17 exo	Ave: 3'18 exo	Ave: 53 exo
	Mean: 4'4" exo		Mean: 3'13" exo		Mean: 2'6" exo	

40cm.

	R	L	R	L	R	L
1	9'45"	+17'20"	5'25"	+7'35"	2'10"	+1'5"
2	16'15"	+16'15"	6'30	+13'	3'15"	+1'5"
3	20'35	+18'25"	9'45'	+5 25	3 35"	+3'15
4	21'45'	[illegible]	5'25"	[illegible]	[illegible]	+1'5
5	21'40"	+10'50"	8'40'	+9'45"	3'15"	+2'10"
	Ave: [illegible]'59' exo	Ave: 15'22" exo	Ave: [illegible] exo	Ave: 10'24" exo	Ave: 7'45" exo	Ave: 1'44 exo
	Mean: 16'14" exo		Mean: 8'47 exo		Mean: 2'17" exo	

20cm.

	R	L	R	L	R	L
1	15'10"	+15'15'	6'30"	+8'40'	2'10'	+3'28
2	15'10"	+10'50'	8'40	+10'50"	2'10"	0
3	10'50	+8'45"	10'50"	+8'40'	0	+2'15"
4	13'	[illegible]	[illegible]	-10'50"	[illegible]	+4'20"
5	8'40'	+10'50'	0'45	[illegible]	4'30"	+6'30'
	Ave: 12'30" exo	Ave: 10'24" exo	Ave: 9'19" exo	Ave: 9'32" exo	Ave: 2'34" exo	Ave: 3'18' exo
	Mean: 11'30" exo		Mean: 9'26 exo		Mean: 2'56" exo	

CURVES DUE TO INDUCED PRISM AT 4.25M

SUBJECT: [illegible] NO: [illegible]

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\overline{X}$	1 Week After Training (Fxd') R	L	$\overline{X}$	6 Weeks After Training (Fxd") R	L	$\overline{X}$
4	10'8"	+8'52	-9'3[illegible]	8'52"	+10'8	[illegible]	5'4"	[illegible]	-3'48"
8	10'28	+10'8'	-13'28	10'8"	+10'8	-10'8"	7'36"	[illegible]	-5'28"
12	N.M	I.D		15'12	+12'[illegible]	[illegible]	10'8"	[illegible]	-8'14
16				14'34	[illegible]	-12'37	10'8"	[illegible]	[illegible]
20				20'16'	+16'[illegible]	-18'22	15'2"	+11'[illegible]	-13'18"
24				[illegible]	[illegible]	[illegible]	20'16'	+16'28"	-18'22'
28				20'16"	+22'[illegible]	-21'32'	Bl.O	Bl.O	
32				N.M.	N.M.				
36									
40									

Base-In Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\overline{X}$	1 Week After Training (Fxd') R	L	$\overline{X}$	6 Weeks After Training (Fxd") R	L	$\overline{X}$
2	1'16"	1'11"	0	0	2'32"	+1'16"	2'32"	0	-1'[illegible]
4	+38"	5'4	+2'50"	+5'4"	[illegible]'20"	+5'42'	[illegible]	[illegible]	[illegible]
6	+30'24'	31'48"	[illegible]	[illegible]	15'2"	[illegible]	[illegible]	11'24	[illegible]
8	+38"	40'32"	+39'16"	25'20	30'24'	+2[illegible]'32	I.D	I.D	
10	I.D.	I.D.		I.D.	I.D.				
12									
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 4.35 M

SUBJECT: J.C. NO: 12

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	I	X̄	1 Week After Training (Fxd') R	L	X̄	6 Weeks After Training (Fxd") R	L	X̄
+0.50	5'48'	[illegible]	-1'36		+36'	-2'27	3'18'	+[illegible]	-1'53
+1.00	+[illegible]38'	+[illegible]	-7'17	[illegible]	+3'16	-[illegible]	2'34"	+[illegible]	-2'[illegible]
+1.50	[illegible]	Bl.O		Bl.O	Bl.O		Bl.O	Bl.O	
+2.00									
+2.50									

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	X̄	1 Week After Training (Fxd') R	L	X̄	6 Weeks After Training (Fxd") R	L	X̄
-0.50	0	3'10	+1'35	+58'	2'52"	+1'[illegible]"	+1'54"	3'48	+2'51
-1.00	+6'58"	10'8'	+8'35'	+4'2[illegible]"	+2[illegible]"	+5'23'	+[illegible]	8'52	+8'14"
-1.50	+10'8'	14'34	+12'21"	+13'[illegible]'	14'34'	+14'15'	+[illegible]	11'24'	+[illegible]
-2.00	J	J		+30'28"	38'38"	+3[illegible]'[illegible]"	I.D.	I.D	
-2.50				Bl.O	Bl.O				

CURVES DUE TO INDUCED PRISM AT 40 cm

SUBJECT: J.C NO: 1

B = Blur   Bl.O = Blur Out   D = Diplopia   E.V. = Extremely Variable

I.D. = Intermittent Diplopia   J = Numbers jumping in and out of focus

N.M. = Numbers moving   V = Variable

Base-Out Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
4	27'3'	+11'28'	-21'45'	14'5'	+13'	[illegible]	4'20	[illegible]	[illegible]
8	[illegible]	+19'42	-22'5'	16'5'	+13	[illegible]	8'40"	[illegible]	-8'40"
12	[illegible]	Bl.O		[illegible]	+18'75"	[illegible]	9'45'	[illegible]	-10'[illegible]
16				18'75"	+22'[illegible]	[illegible]	13'	[illegible]	-14'3"
20				[illegible]	+21'40	[illegible]	13'	[illegible]	-14'58"
24				[illegible]	-2	-75'23"	16'15	+16'15	-16'15
28				18'20'	-2	-23'5"	Bl.O	Bl.O	
32				Bl.O	Bl.O				
36									
40									

Base-In Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
2	21'40'	+17'[illegible]	-19'[illegible]	5'25"	+4'25'	-4'5[illegible]	2'10"	+2'[illegible]	-2'40'
4	5'25'	+9'45"	-7'30	6'[illegible]	+4'20"	-5'25"	+2'10"	1'5"	[illegible]
6	10'50'	+10'5[illegible]	[illegible]'50"	[illegible]'20"	+3'15'	-3'48'	+2'10"	[illegible]	-1'[illegible]
8	3'15"	0	-1'58"	[illegible]	2'10	+1'5"	+5'25'	4'24	+4'53
10	+4'20'	4'50	+5'25"	+4'20"	4'20"	+4'20"	+8'40"	9'35"	+8'8
12	+5'25"	5'25"	+5'23	9'45"	13'	+11'23	+10'50"	11'55"	+11'23"
14	11'55	17'20"	-14'38"	Bl.O	Bl.O		Bl.O	Bl.O	
16	Bl.O	Bl.O							
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 40cm

SUBJECT: J.C. NO: 17

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
+0.50	14'5'	+16'25	-15'45'	5' 5"	+9'45	-7'25"	2'10'	+2.1	-2'10'
+1.00	-15'5"	+[illegible]	-15[illegible]	[illegible]	+13'	-11'[illegible]	2[illegible]'	+[illegible]	-5'25'
+1.50	[illegible]	+[illegible]	-21'40'	1[illegible]	[illegible]	-[illegible]48'	8[illegible]	+1"	-4'15
+2.00	[illegible]	+17'30	25'[illegible]	2[illegible]	+22'	-22'05	11'55	+11'[illegible]	-11'55
+2.50	2[illegible]	+24'[illegible]	27[illegible]	[illegible]	+26	-2[illegible]	1'35"	+14	-13'

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
-0.50	14'5'	+9'45	-11'55"	3'35"	+4'10"	-3'48'	1'9"	0	-33"
-1.00	5'25"	+1'5'	-3'15'	3'19"	+4'20'	-3'48'	+3 15'	3'15"	+3'15"
-1.50	3'15"	+5'25'	+4'20'	[illegible]'30'	1'5"	+3'48'	+6'30"	4'20"	+5'25"
-2.00	0	2'10"	+1'5"	+10'50"	6'30"	+8'40"	+9'45"	8'40"	+9'13'
-2.50	+6'50"	4'20"	+5'[illegible]	+11'55'	10'50"	+11'23"	+13'	10'50'	+11'55"

MAGNITUDE OF FIXATION DISPARITY

SUBJECT: J.M. **NO:** 18

4.25m **Fxd.** **Fxd.'** **Fxd."**

	R	L	R	L	R	L
1	+10'8"	10'8"	+7'36"	8'14"	+7'36"	8'14"
2	+5'4	5'42"	+6'20"	7'36'	+6'20'	6'20"
3	+10'8"	[illegible]	+6'20"	6'58"	+4 [illegible]	3'48"
4	+3'48"	[illegible]	+8'52"	6'20"	+5'4"	6'58"
5	+3'48'	5'4	+5'4"	5'42"	+5'4'	4'26"
	Ave: 6'35" eso	Ave: 6'43" eso	Ave: 6'50" eso	Ave: 6'58" eso	Ave: 5'42" eso	Ave: 5'57" eso
	Mean: 6'39" eso		Mean: 6'54" eso		Mean: 5'50" eso	

40cm.

	R	L	R	L	R	L
1	+20'35"	27'5"	+20'35"	24'55"	+13'	17'20'
2	+21'40'	26'	+21'40"	20'50"	+16'15"	16'15"
3	+18'24"	24'2[illegible]"	+[illegible]	[illegible]	+10'50'	11'55"
4	+2[illegible]'35'	23'50	+2[illegible]	[illegible]5	+11'55'	6'30"
5	+24'55"	26'	+20'34"	24'55"	+8'40"	10'50"
	Ave: 21'24" eso	Ave: [illegible] eso	Ave: [illegible]	Ave: 25'8" eso	Ave: 12'3 eso	Ave: 12'34" eso
	Mean: 23'24" eso		Mean: 22'58" eso		Mean: 12'21 eso	

20cm.

	R	L	R	L	R	L
1	3'40"	+10'50	[illegible]	0	0	0
2	17'	+8'40"	[illegible]	0	0	+2'10"
3	11'12"	+13'[illegible]	0	0	2'10'	0
4	10'50"	[illegible]	[illegible]	[illegible]	0	0
5	13"	[illegible]	0	2'1[illegible]	0	[illegible]
	Ave: 11'20" exo	Ave: 8'50" exo	Ave: 26" exo	Ave: [illegible]	Ave: 26" exo	Ave: 0
	Mean: 10'5" exo		Mean: 26" exo		Mean: 13" exo	

CURVES DUE TO INDUCED PRISM AT 4.25M

SUBJECT: J.M. NO: 18

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	X	R	L	$\bar{X}$
4	+1'54'	3'14'	+2'33	+1'42"	2'32'	[illegible]	+2'32"	1'54"	+2'1"
8	0	0	0	1'	[illegible]	19	38"		-19'
12	14'	38'	0	-8	[illegible]	[illegible]	38	+1'16	-37
16	1'16	+38'	-59	[illegible]	+2'14	[illegible]	1'54"	0	-57"
20	1'54	0	-59	[illegible]	+3'	[illegible]	3'10'	+2'38"	-2'51"
24	+8'	-1'10	-2'18"	[illegible]	+3'[illegible]	[illegible]	4'26"	+1'54"	-3'10"
28	[illegible] N.M.	+5'4	[illegible]	Bl.O	Bl.O		3'4"	[illegible]	-6'[illegible]
32	Bl.O	Bl.O					Bl.O.	Bl.O	
36									
40									

Base-In Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
2	+6'20"	6'20"	+6'20"	+10'8"	[illegible]'24	[illegible]	+10'8"	8'52"	+9'30"
4	+17'44"	20'5'	+19'	+17'44	15'12'	+16'28"	+16'28"	19'	+17'41
6	I.D.	I.D.		[illegible]	[illegible]	+38'19	+43'42'	42'34"	+42'[illegible]
8				+[illegible] 32'	42'52'	+42'12	I.D.	I.D.	
10				D	D				
12									
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 4.25 M

SUBJECT: J.M. NO: 25

B = Blur B1.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
+0.50	+10'8'	10'8'	+10'8'	+6'53"	8'52'	+7'[illegible]	+1'20	8'[illegible]	+[illegible]
+1.00	BL.O	BL.O		BL.	BL.O		BL.O	B	
+1.50									
+2.00									
+2.50									

Minus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
-0.50	+17'44"	17'44"	+17'44"	+12'48'	14'29'	+13'39'	+13'56'	12'2	+12'59
-1.00	BL.O	BL.O		+27'32'	25'20"	+26'36"	+25'20'	30'24	+27'52
-1.50				+17'4'	22'16'	+19'37'			
-2.00				I.D.	BL.O				
-2.50									

CURVES DUE TO INDUCED PRISM AT 40cm

SUBJECT: J.M. **NO:** 18

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
4	+9'45"	10'50"	+10'18"	+15'[illegible]	14'[illegible]	14'38"	+4'20"	7'35"	+5'58"
8	+3'15"	2'10"	+2'43"	1'50"	?	+5'25"	+2'20"	2'10"	+2'10"
12	2'30"	+2'10"	-2'10"	0	+2'10"	-1'5"	0	+2'25"	1'5
16	5'25"	-4'20"	-4'55	1'5"	+3'15"	-2'10"	3'15"	[illegible]	-2'10"
20	10'50"	0 V	-5'25"	5'25"	+6'30	-5'58"	6'30"	-5'15"	-5'58"
24	[illegible]	+9'45"	-11'55"	5'25"	+8'40"	-7'3"	[illegible]'30"	+7'35"	-7'3"
28	N.M.	N.M.		10'50"	+8'40"	-9'45"	10'50"	-9'45"	-10'18"
32				10'50"	+10'50"	-10'50"	N.M.	[illegible]	
36				N.M.	N.M.				
40									

Base-In Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
2	+29'15"	32'[illegible]"	+30'53"	+30'20"	27'5"	+28'45"	+10'50"	13'	+11'45"
4	+29'15" V	26'	+27'35"	+28'10"	27'5"	+27'38"	+16'15"	18'25"	+17'20"
6	+30'20"	29'5"	+29'42"	+29'5"	20'35" V	+24'50"	+17'20"	20'55	+18'58"
8	N.M.	N.M.		+27'5"	30'20"	+28'43"	+23'50"	26'	+24'55"
10				+32'30"	33'35"	+33'3"	N.M.	E.V.	
12				I.D.	I.D.				
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 40cm

SUBJECT: J.R. NO: 13

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
+0.50	+16'35'	14	+15'10'	[illegible]	14'	+16'15"	+5'25'	5'25'	+6'30"
+1.00	-9'45'	-7'35	-8'40	[illegible]	3'25	[illegible]	+5'25"	5'25	+5'25'
+1.50	-2'5'	-2'25	-1'5'	[illegible]	0	+1'	2'15"	+1	-1'38
+2.00	-4'20	-2'5	-2'43'	[illegible]	-4'20'	-1'35"	0	+1'5	-2'10'
+2.50	5'25"	+6'30'	-5'52'	[illegible]	+8'40	-2'5'	2'10"	[illegible]	-3'45"
	STOP	STOP		STOP	STOP		STOP	STOP	

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
-0.50	+29'15"	27'5'	+28'10"	+29'15"	27'5"	+28'10"	+23'50'	27'5'	+25'28
-1.00	N.M.	N.M.		+24'05' V	27'5"	+26	+24'55'	22'45'	+23'50'
-1.50				Bl.O	Bl.O.		Bl.O	Bl.O	
-2.00									
-2.50									

MAGNITUDE OF FIXATION DISPARITY

SUBJECT: P.S. **NO:** 29

4.25m **Fxd.** **Fxd.'** **Fxd."**

	R	L	R	L	R	L
1	2'32"	+1'16'	1'16"	0	1'16"	+38"
2	2'32'	+1'54"	1'54"	+38"	38"	[illegible]
3	1'20"	+38"	1'54"	+38"	0	+38"
4	2'32"	[illegible]	2'32"	+1'16"	0	+1'16"
5	2'32"	+38"	1'54'	+38"	0	+38"
	Ave: 2'38' exo	Ave: 1'1' exo	Ave: 1'54' exo	Ave: 38' exo	Ave: 23' exo	Ave: 1'48' exo
	Mean: 1'50' exo		Mean: 1'16" exo		Mean: 1'6" exo	

40cm.

	R	L	R	L	R	L
1	9'45"	+7'35"	1'5"	+15	2'10"	+3'15"
2	13'	+9'45"	3'15"	+3'15"	3'15"	+3'15"
3	13	+10'50"	1'5"	[illegible]	2'10"	+3'15"
4	[illegible]	[illegible]	[illegible]	[illegible]	1'5"	+4'20"
5	13'	+9'45"	1'5"	+15"	3'15"	+1'5"
	Ave: 12'21" [illegible]	Ave: [illegible]	Ave: [illegible]	Ave: 2'39' exo	Ave: 2'23 exo	Ave: 3'2" exo
	Mean: [illegible]		Mean: [illegible] exo		Mean: 2'43' exo	

20cm.

	R	L	R	L	R	L
1	17'20	+13'52	10'50'	+6'30	6'30'	+8'40'
2	21'40'	+17'20"	10'50"	+10'50"	2'10"	+8'40"
3	15'10'	+15'10	6'30'	+13'	8'40"	+8'40"
4	19'30"	+19'30	[illegible]	+13'	4'	+10'50"
5	15'10	+13"	10'50"	[illegible]	8'40	+8'40'
	Ave: 17'46' exo	Ave: 15'46' exo	Ave: 9'2" exo	Ave: 10'24' exo	Ave: 6'4" exo	Ave: 9'6" exo
	Mean: 16'46" exo		Mean: 9'43' exo		Mean: 7'35" exo	

CURVES DUE TO INDUCED PRISM AT 4.25M

SUBJECT: R.S. **NO:** 12

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\overline{X}$	1 Week After Training (Fxd') R	L	$\overline{X}$	6 Weeks After Training (Fxd") R	L	$\overline{X}$
4	5'4"	+1'54	-3'29"	3'1[illegible]	+3'1[illegible]	-1'53	1'54"		-57"
8	5'4"	+3'48'	-4'6	3'18	[illegible]	[illegible]	[illegible]	[illegible]	-1'43'
12	5'4'	+3'48	-4'26'	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-2'32"
16	5'4'	-3'48	-4'26	0	+2'32	-1'16"	3'48'	[illegible]	-3'10"
20	5'4"	+3'30'	-4'7'	[illegible]	+2'32"	-3'48	3'48	[illegible]	-4'26"
24	5'4"	+3'48"	[illegible]	3'10'	+1'54'	-2'32"	6'20"	+7'36	-6'58"
28	6'20'	+3'48'	5'4'	6'58	+4'	42"	Bl.O	Bl.O	
32	6'20'	+3'48'	5'4'	5 [illegible]	+3'48	-4'26'			
36	Bl.O	Bl.O		Bl.O	Bl.O				
40									

Base-In Prism	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\overline{X}$	1 Week After Training (Fxd') R	L	$\overline{X}$	6 Weeks After Training (Fxd") R	L	$\overline{X}$
2	0	1'1	+38"	1'16"	0	-38"	+1'54"	38"	+1'16"
4	+38"	2'37"	+1'30"	[illegible]	38"	+38"	+2'32"	2'32"	+2'32"
6	+5'4"	5'42"	+5'23"	+2'32"	[illegible]	+3'10"	+6'20"	1'57"	4'9"
8	I.D.	I.D.		+6'10"	6'58	+6'30"	+12'40	10'8"	+11'24
10				D	D		D	D	
12									
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 4.25 M

SUBJECT: 25 NO: 29

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
+0.50	2'34 B	+55 B	-1'5"	0	+26" B	-15"	1'16	±	-38
+1.00	2.0	[illegible]		0	20		20		
+1.50									
+2.00									
+2.50									

Minus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
-0.50	0	0	0	0	38"	+29"	+1'16	38"	+57"
-1.00	0	1'1"	+38'	+1'54	38	+1'16"	+2'32	2'32"	+2'32"
-1.50	+1'16	2'34'	1'54	+3'48	3'10	+3'29	+3'10	3'48"	+3'29"
-2.00	+1'16"	2'32"	+1'54"	+4'26"	5'42"	+5'3"	+3'48	4'26"	+4'7"
-2.50	+2'32" B	5'4" B	+3'48"	+6'20	10'8"	+8'14"	+8'14	10'8"	+9'11
	5'00	5'00		5'00	5'00				

CURVES DUE TO INDUCED PRISM AT 40 cm

SUBJECT: [illegible]　　NO: 10

B = Blur　Bl.O = Blur Out　D = Diplopia　E.V. = Extremely Variable

I.D. = Intermittent Diplopia　J = Numbers jumping in and out of focus

N.M. = Numbers moving　V = Variable

Base-Out Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	X	R	L	$\bar{X}$
4	17'20'	+15'[illegible]	-16'30'	5'25'	+5'[illegible]	-5'25'	3'15"	+6'30'	-4'53'
8	18'25'	+16[illegible]	-17'30'	[illegible]	+4	-4'53'	6'30"	+4	-5'25"
12	20'35	+16'25	-18'25"	8'[illegible]	+5'[illegible]	-7'3"	8'40"	+7'30"	-8'8'
16	21'40	+19'30	-20'35"	8'40'	+7'3[illegible]	-8'8'	10'58"	+8'[illegible]	-9'[illegible]
20	32'30	+28'[illegible]	-30'20'	16'15"	+11	-[illegible]	11'55"	+6'30	-9'13"
24	32'30	+30'20	-31'25"	15'10'	+16'25'	-15'43'	Bl.O	Bl.O	
28	32'30	+29'15	-30'53'	Bl.O	Bl.O				
32	34'40	+31'[illegible]	-33'5						
36	Bl.O	Bl.O							
40									

Base-In Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
2	10'50"	+8'40"	-9'45"	1'5"	+1'5"	-1'5"	2'10"	+2'10"	-2'10"
4	10'50"	+13'	-11'55"	[illegible]	0	+33"	+1'5"	+1'5"	0
6	5'25"	0	-2'43"	+3'15	3'15"	+3'15	+1'5"	1'5"	+1'5"
8	+5'25"	4'20"	+4'53"	+3'15"	4'20"	+3'48"	+3'15"	4'20'	+3'48'
10	+8'40"	10'50"	+9'45'	+5'25'	4'20"	+4'53"	+8'40"	4'20'	+6'30"
12	+8'40'	9'45"	+9'13"	+6'30"	6'30"	+6'30"	+10'50"	13'	+11'55"
14	+16'15	22'45'	+19'30"	+14'5'	17'20"	+15'43'	+10'50"	14'5"	+12'28"
16	+22'45'	21'40"	+22'15"	+17'20"	18'25"	+17'53'	+15'10"	18'25	+16'48'
18	I.D	I.D		Bl.O	Bl.O		+18'25"	19'30	+18'58'
20							Bl.O.	Bl.O	
22									

CURVES DUE TO INDUCED LENSES AT 40 cm

SUBJECT: R.S. NO: 9

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
+0.50	13' V	+5'25"	-9'15"	+30"	0	[illegible]	3'15"	[illegible]	+4'20"
+1.00	10'25"	[illegible]	-11'55"	[illegible]	+15"	+2'15"	[illegible]	[illegible]	+4'55"
+1.50	6'15"	+15'55"	[illegible]	[illegible]	+4'2	-2'15"	5'20"	[illegible]	[illegible]
+2.00	[illegible]	[illegible]	[illegible]	x	N.M.		3'15"	[illegible]	+3'15"
+2.50	[illegible]	-15'25"	+2'15"				Bl.O	[illegible]	
	[illegible]	[illegible]							

Minus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
-0.50	7'35" V	+4'20"	5'05"	0	+11"	-55"	2'25"	0	-15"
-1.00	2'15"	+2'20"	-2'48"	0	1'20"	+1'5"	0	0	0
-1.50	7'35"	+4'2	-3'53"	+3'20"	+1'45"	-55"	+3'25"	+1'5"	+1'5"
-2.00	+4'20"	0	+2'10"	+2'25"	6'30"	+5'58"	Bl.O	Bl.O	
-2.50	+7'35"	11'55"	[illegible]	Bl.O	Bl.O				
	[illegible]	[illegible]							

MAGNITUDE OF FIXATION DISPARITY

SUBJECT: S. v.D.   **NO:** 20

4.25m

	Fxd. R	Fxd. L	Fxd.' R	Fxd.' L	Fxd." R	Fxd." L
1	1'54"	+1'16"	38	+1'16"	0	+38"
2	1'54"	+2'32"	1'16"	+38"	0	38"
3	1'16"	+2'32'	38"	+38'	+38"	+38"
4	1'54"	-1'16	1'16"	+38"	0	0
5	1'54"	+1'16"	0	+38"	1'16"	+38"
	Ave: 1'46" ex	Ave: 1'46 exo	Ave: 46' exo	Ave: 46 exo	Ave: 8" exo	Ave: 15' exo
	Mean: 1'46" exo		Mean: 46" exo		Mean: 12 exo	

40cm.

	R	L	R	L	R	L
1	9'45	+10'50"	1'5	0	5'25"	+8'40
2	16'15	+24'55'	4'20"	+6'30"	10'50"	+14'5"
3	22'45	+27	5 25	+7 35	10'35	+35'
4	[illegible]	+21'5	4 20	+4'40'	10 50	+[illegible]
5	29'35"	+24 55	7 35"	+8'40'	10'50"	14'5"
	Ave: 20'4" exo	Ave: [illegible] exo	Ave: 4'33" exo	Ave: [illegible] exo	Ave: 9'45" exo	Ave: 12'34 exo
	Mean: 21 [illegible] exo		Mean: 5'25" exo		Mean: [illegible] exo	

20cm.

	R	L	R	L	R	L
1	6'40	+8'14'	4'20"	+6'30'	6'30"	+4'20'
2	16'2	+[illegible]'56"	6'30"	+10'50"	6'30"	+6'30"
3	9'4"	+9'58"	4'20	+10'50"	6'30"	+6'30"
4	[illegible]	+[illegible]	6'[illegible]	[illegible]	4'20	+8'40"
5	8'40	[illegible]			8'40"	+10'50"
	Ave: 10'12" ex	Ave: 7'58" exo	Ave: 5'25" exo	Ave: 10'18" exo	Ave: 6'30" exo	Ave: 7'22" ex
	Mean: 9'5" exo		Mean: 7'52" exo		Mean: 6'56" exo	

CURVES DUE TO INDUCED PRISM AT 4.25M

SUBJECT: S. V. NO: 2

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\overline{X}$	R	L	$\overline{X}$	R	L	$\overline{X}$
4	6'2[illegible]	+4'26	-5'23	[illegible] 12	+2 [illegible]	-[illegible] 12"	[illegible]	[illegible]	3'[illegible]
8	5'4"	+3'48	-4'26"	[illegible]	+2'24	[illegible]	[illegible]	[illegible]	-2'[illegible]
12	[illegible]	+5 -	4'[illegible]	[illegible]	+2'32'	[illegible]	'46	[illegible]	-3'3[illegible]
16	[illegible]	+7'4[illegible]	-4'26"	3'[illegible]	+3'2[illegible]	-3'27	'48	[illegible]	4'[illegible]"
20	[illegible]	+5'4	+5'4"	[illegible]	[illegible]	[illegible]	'20"	+2'32"	-4'2[illegible]"
24	10'[illegible]	[illegible]	-8'24	[illegible]	[illegible]	[illegible]	6'24"	[illegible]'48"	-5'4"
28	12'40	+8'14	-10'27	5'4"	+3'24"	-4'7	[illegible]'36	+4'26"	-6'1"
32	15'12"	+1[illegible]	-14'34'	6'26'	+6'[illegible]	-6'34"	11'24"	[illegible]'56"	-9'11"
36	22'[illegible]	+24'[illegible]"	-23'25	8'52'	+8'52	-8'52'	15'12"	[illegible]'52	-12'[illegible]
40	30'24"	+28'30"	-29'27	8'52"	+10'8"	-9'30"	17'4[illegible]	+16'28"	-17'[illegible]

Base-In Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\overline{X}$	R	L	$\overline{X}$	R	L	$\overline{X}$
2	+38"	1'57"	+1'16	+1'16	1'54"	+1'35"	+38"	1'54	+1'[illegible]
4	+8'52"	8'52	+8'52"	-8'52"	8'52"	+8'52"	+8'52'	10'8	+9'38
6	+43'4' V	40'32" V	+41'4[illegible]	+35'28'	31'40"	+33'34"	+20'16	24'4	+22'10
8	D	D		EV	EV		ID	ID	
10									
12									
14									
16									
18									
20									
22									

CURVES DUE TO INDUCED LENSES AT 4.25 m

SUBJECT: [illegible] NO: 20 B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
+0.50	1'54' 3	+3' 3	-1'16"	1'16'	33'	-.5'	1'16	[illegible]	-3'
+1.00	1'54 3	+4' 3	-1'	BL.O	BL.O		[illegible]	[illegible]	
+1.50	[illegible]	BL.O							
+2.00									
+2.50									

Minus Spheres	Magnitude of Fixation Disparity: Before Training (Fxd) R	L	$\bar{X}$	1 Week After Training (Fxd') R	L	$\bar{X}$	6 Weeks After Training (Fxd") R	L	$\bar{X}$
-0.50	+38"	1'16'	+59"	0	+1'10"	35'	0	0	0
-1.00	+3'10"	2'10"	+3'10"	+1'10"	38	+57"	+1'16	38	+57"
-1.50	+10'8"	7'36'	+8'52"	+2'38"	1'54'	+2'23'	+1'54'	1'54"	+1'54
-2.00	+20'16"	19'38	+19'57	+4'2"	[illegible]	+4'50'	+5'4"	4'26	+4'45
-2.50	+30'24'	35'28	+32'56'	+4'4	7'34	+6'20	+3'48	5'4'	+4'26
	BL.O	BL.O		STOP	STOP		STOP	STOP	

CURVES DUE TO INDUCED PRISM AT 40 cm

SUBJECT: S. D.   NO: 2

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Base-Out Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	X	R	L	$\bar{X}$
4	32'30	+20'15	-30'53'	[illegible]	[illegible]	+17'20"	[illegible]	[illegible]	[illegible]
8	[illegible]	[illegible]	-26'30	11'55	[illegible]	-16'10	[illegible]	+10	[illegible]
12	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-10'25'	[illegible]	[illegible]	[illegible]
16	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	-1'43'	20'35"		[illegible]
20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	27'20"	[illegible]	-19'4
24	[illegible]	[illegible]	[illegible]	15'30	+12	-17'20	18'25"	[illegible]	-20'52'
28	23'15	+20' V	-28	18'35 V	+20	-20'35"	25'10"	[illegible]	-21'8
32	[illegible]	+30'2 EV	-30'53	17' V	+18'40"	[illegible]	E.V.	EV	
36									
40									

Base-In Prism	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
2	9'45"	+7'35"	-8'40'	[illegible]20"	+5'25"	-4'33'	9'45'	+8'40"	-9'13'
4	1'5"	+2'10"	-1'38'	3'25"	+1'5	-2'10'	2'10"	+4'0"	-3'15"
6	3'15'	+1'5"	-2'10'	+4'20"	[illegible]	[illegible]	0	+1'5	-32
8	Bl.O	Bl.O		+11'30'	9'45'	-10'38	+1'5"	1'5	+1'5
10				+11'55"	10'55"	+11'25'	+4'20"	1'5	+2'43
12				+9'15"	8'40	+9'13'	+1'30"	5'25	+5'58'
14				+9'15"	9'45'	+9'48"	+5'25"	4'20'	+4'53'
16				Bl.O	Bl.O		+9'40'	10'50"	+9'45'
18							+14'5"	10'50"	+12'28
20							+16'50	10'35	+16'23'
22							EV	EV	

CURVES DUE TO INDUCED LENSES AT 40 cm

SUBJECT: S. W.   NO:

B = Blur Bl.O = Blur Out D = Diplopia E.V. = Extremely Variable

I.D. = Intermittent Diplopia J = Numbers jumping in and out of focus

N.M. = Numbers moving V = Variable

Plus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
+0.50	16'15"	[illegible]	[illegible]	4'20"	+8'40"	-6'30"	15'15"	+18'25"	-16'50"
+1.00	13'	-10'5"	-11'35"	8	+11'50"	-9'45	16'15	+.9	-15'33"
+1.50	[illegible]	[illegible]	-20'48	22'35	+1[illegible]	-12'21	15'	+20'55'	16'48'
+2.00	[illegible]	+25'30"	-27'15	14'5	+20'35	-1[illegible]	13'	-20'55'	-16'48"
+2.50	[illegible]	+2[illegible]	-28'10"	[illegible]	30[illegible]		22'45'	+22'40	-22'45'
	STOP	STOP					30.0.	8'	

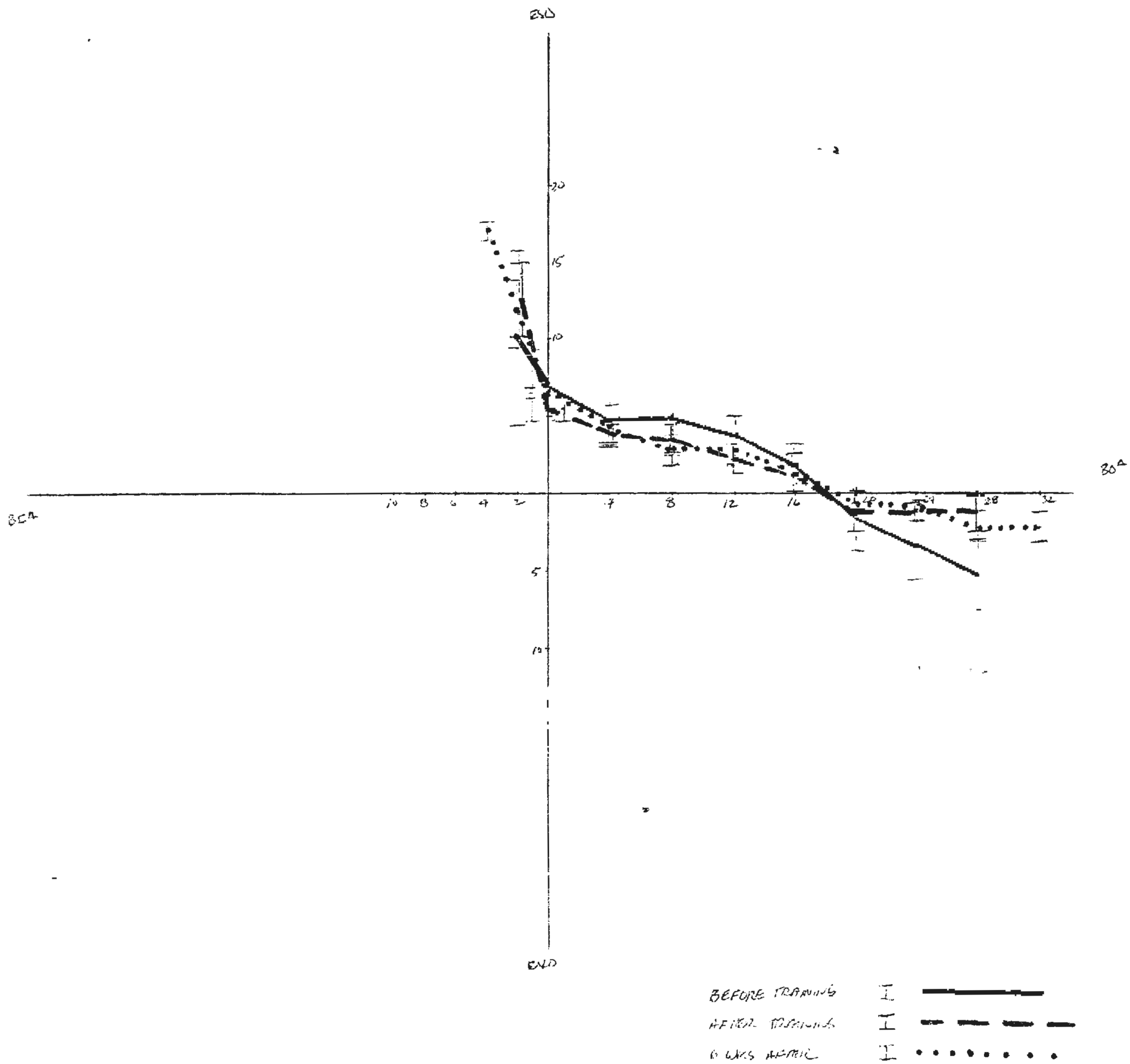
Minus Spheres	Magnitude of Fixation Disparity								
	Before Training (Fxd)			1 Week After Training (Fxd')			6 Weeks After Training (Fxd")		
	R	L	$\bar{X}$	R	L	$\bar{X}$	R	L	$\bar{X}$
-0.50	8'40"	+4'20"	-6'30"	2'10'	+4'20"	-3'15'	10'50"	+14'5"	-12'20
-1.00	3'15"	0	-1'38'	+1'5"	-1'5'	0	6'30'	+7'35	-0'3'
-1.50	2'10"	+1'5"	-1'38	+3'15"	0	+1'38	+3'15"	+2'10'	+33
-2.00	+16'15"	17'20'	+16'48	+5'45"	4'20	+7'3'	+5'25"	3'15"	+4'20'
-2.50	+22'15	21'[illegible]	+22.[illegible]	30'0	35'0		+8'40"	7'35	+8'[illegible]
	STOP	STOP							

APPENDIX D

DAVE STACY

PRISM 's 45 M

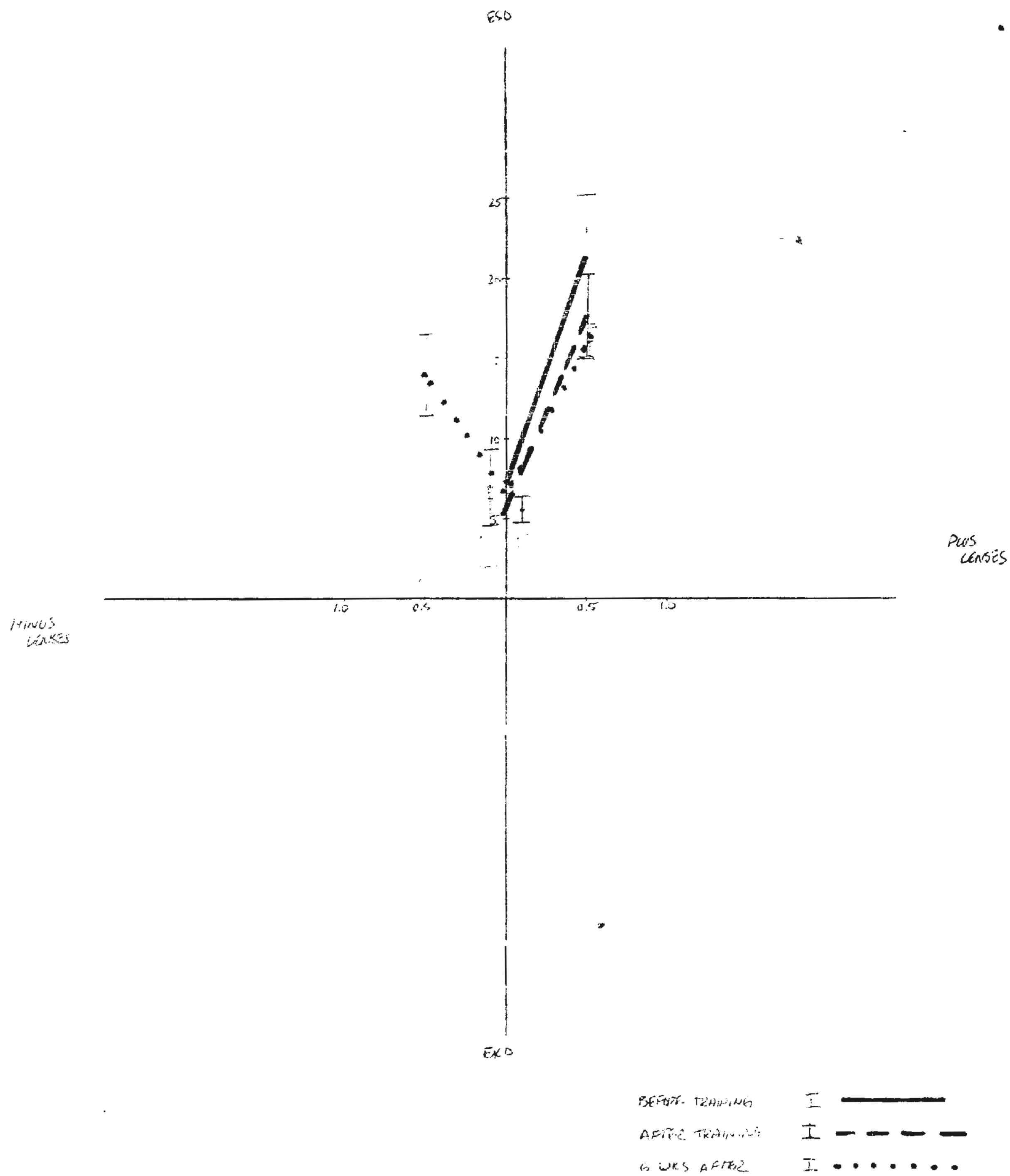
NO. 1



DAVE STACY

LENSES @ 4.5M

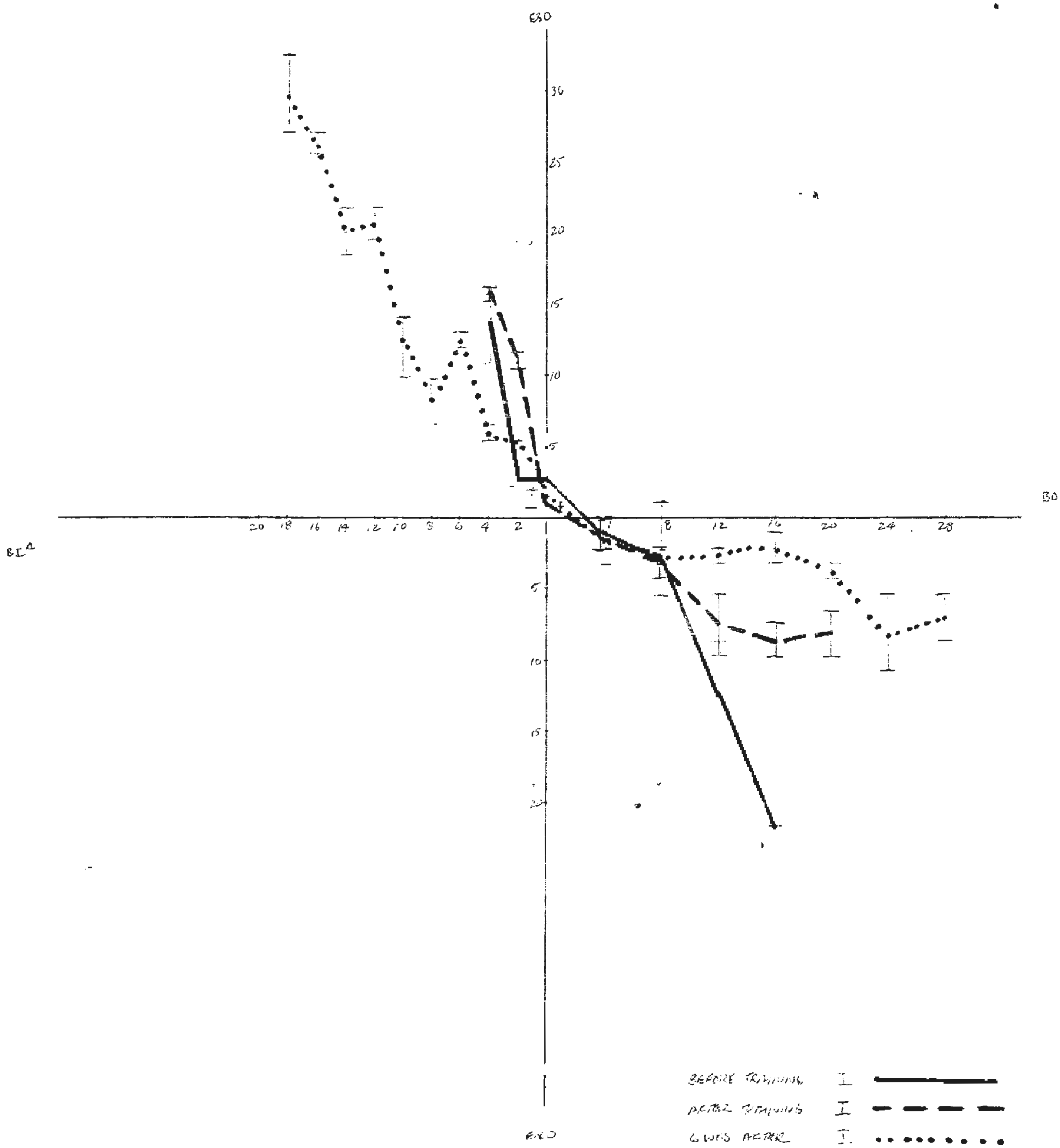
NO. 1



DAVE STACY

PRISM c̄ 40 CM

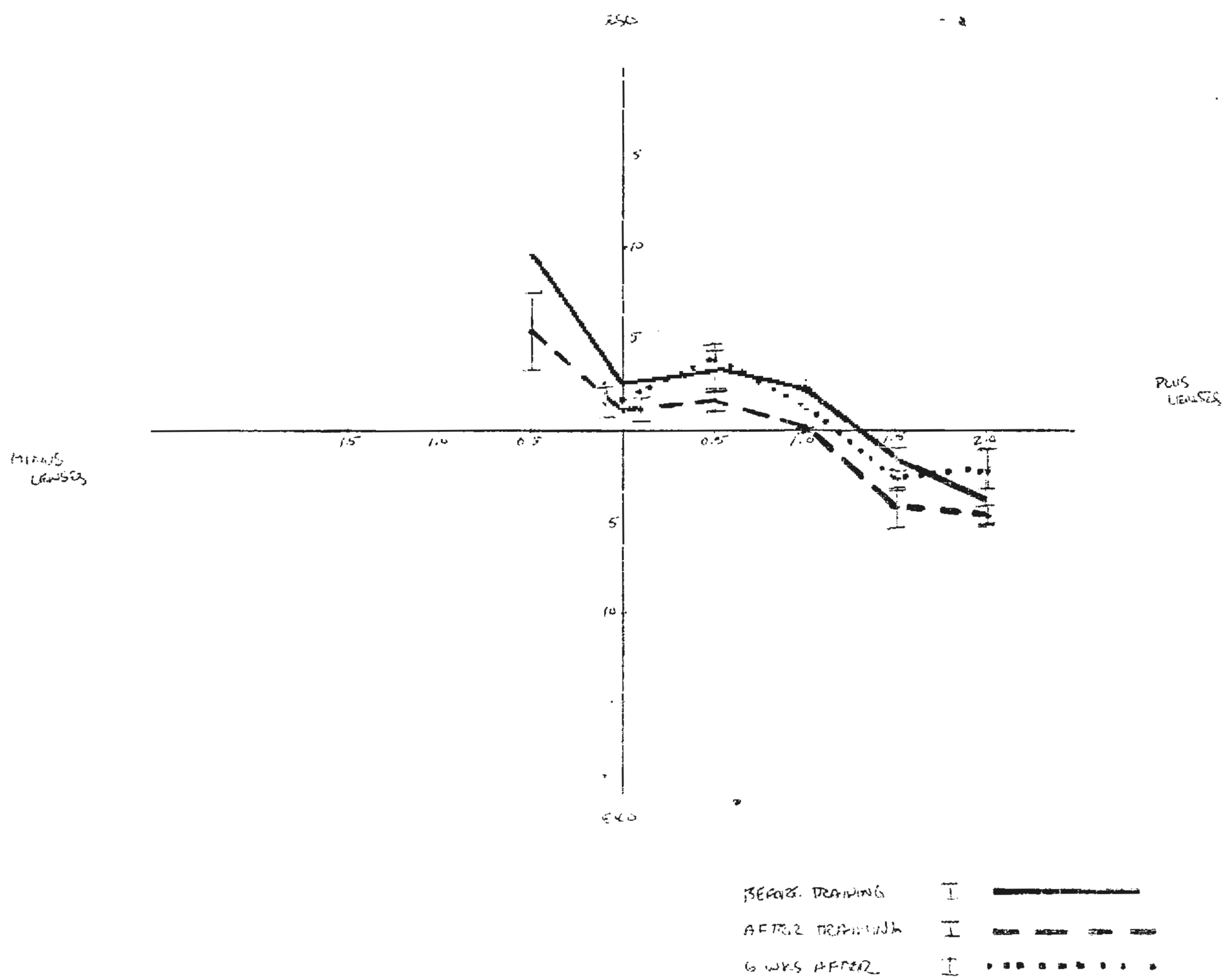
NO. 1



DAVE STACY

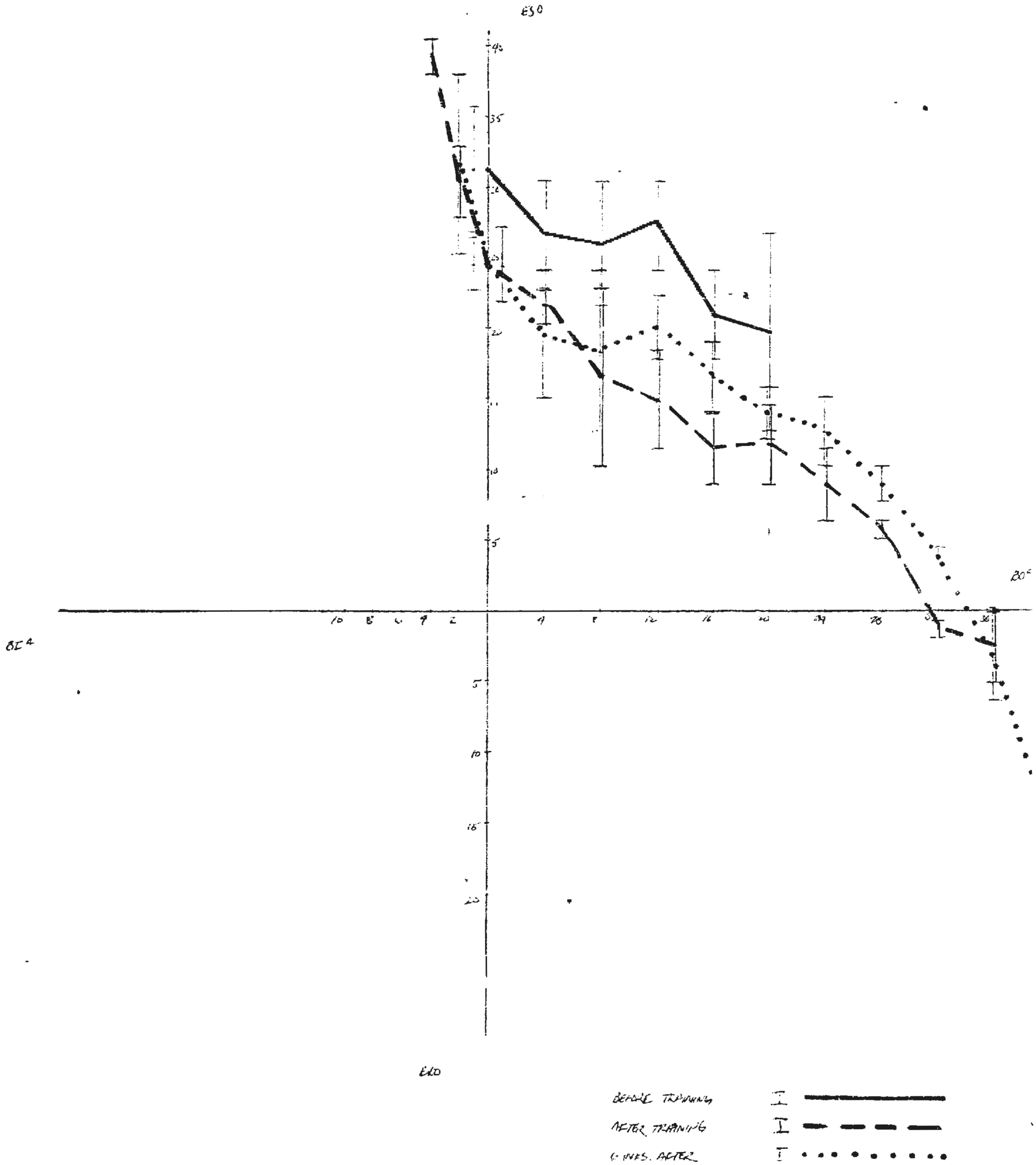
LENSES @ 40 CM

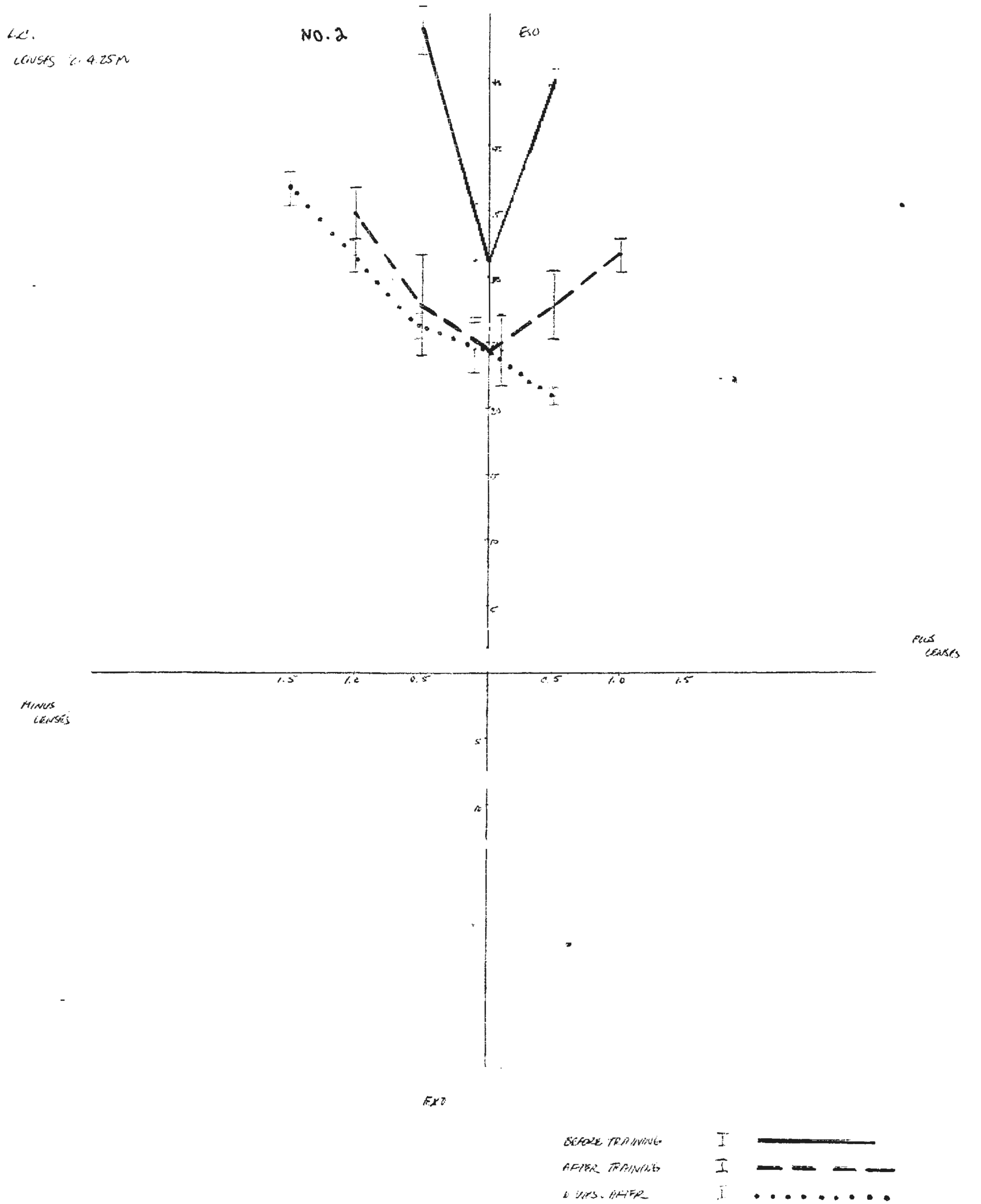
NO. 1



L.C.
PRISM @ 4.25 M

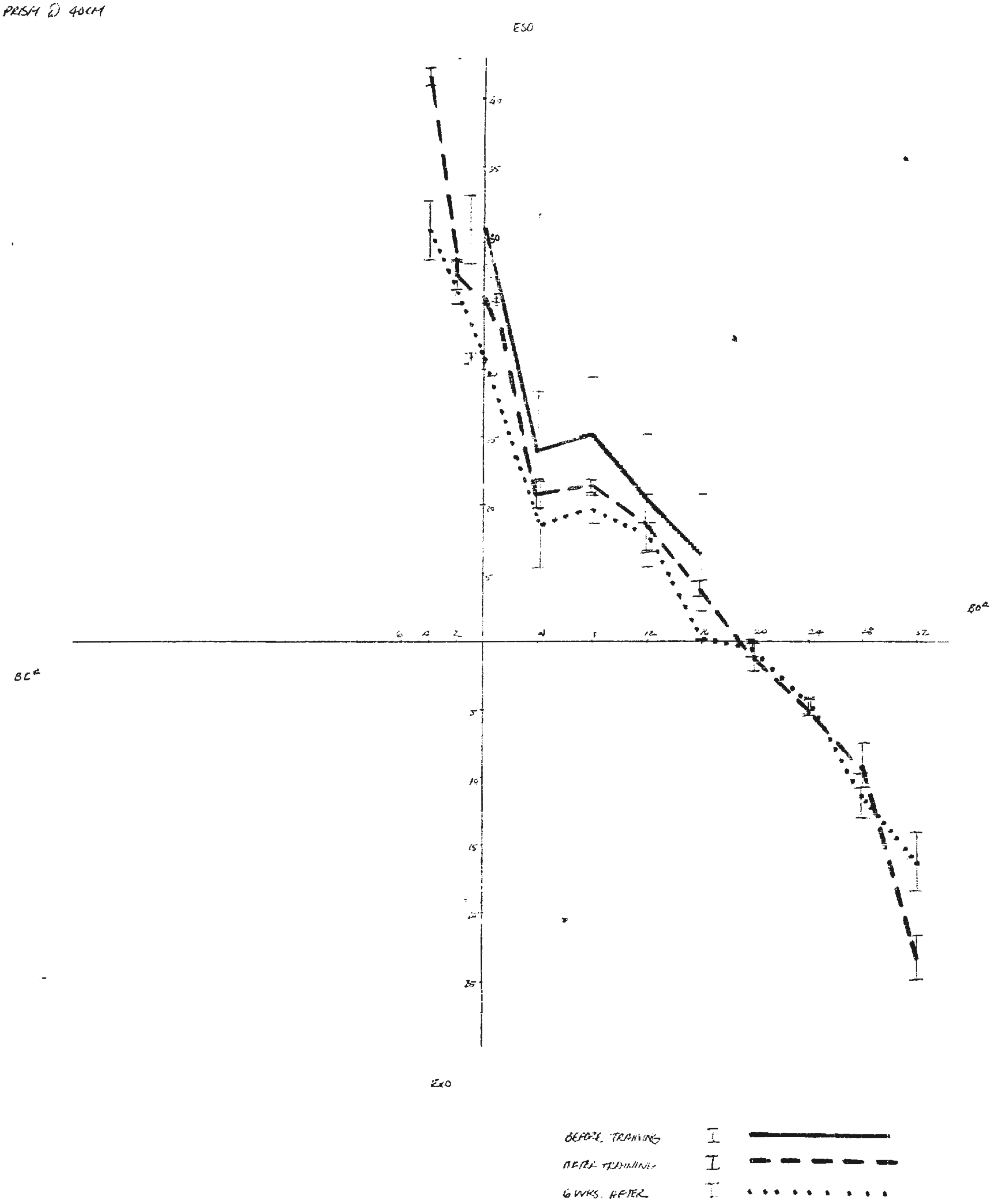
NO. 2




L.C.
LENSES @ 4.25M
NO. 2
ESO
EXO
PLUS LENSES
MINUS LENSES
1.5
1.0
0.5
0.5
1.0
1.5
BEFORE TRAINING
AFTER TRAINING

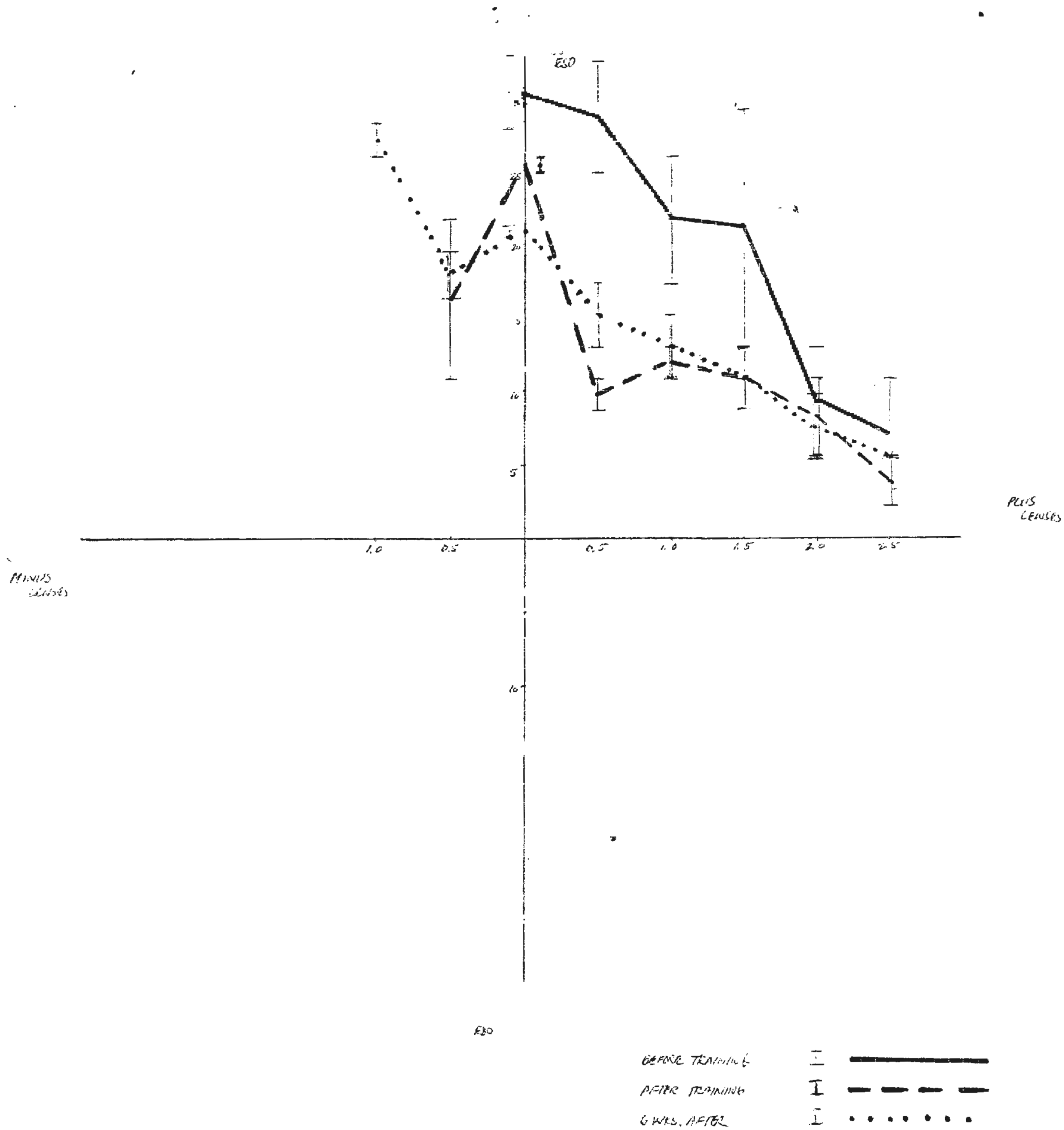
C.C.
PRISM @ 40CM

NO. 2



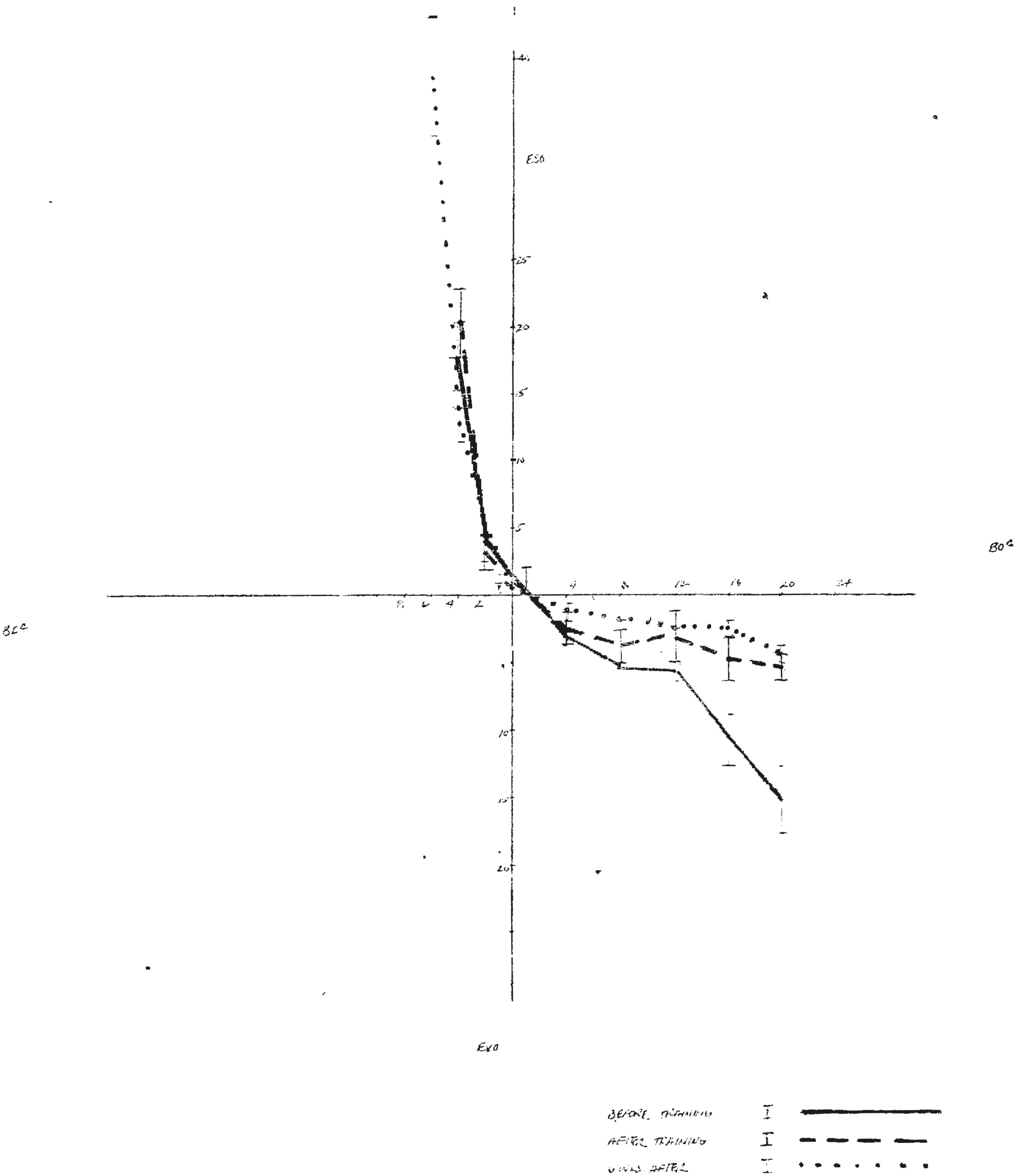
L.C.
LENSES @ 40 CM

NO. 2



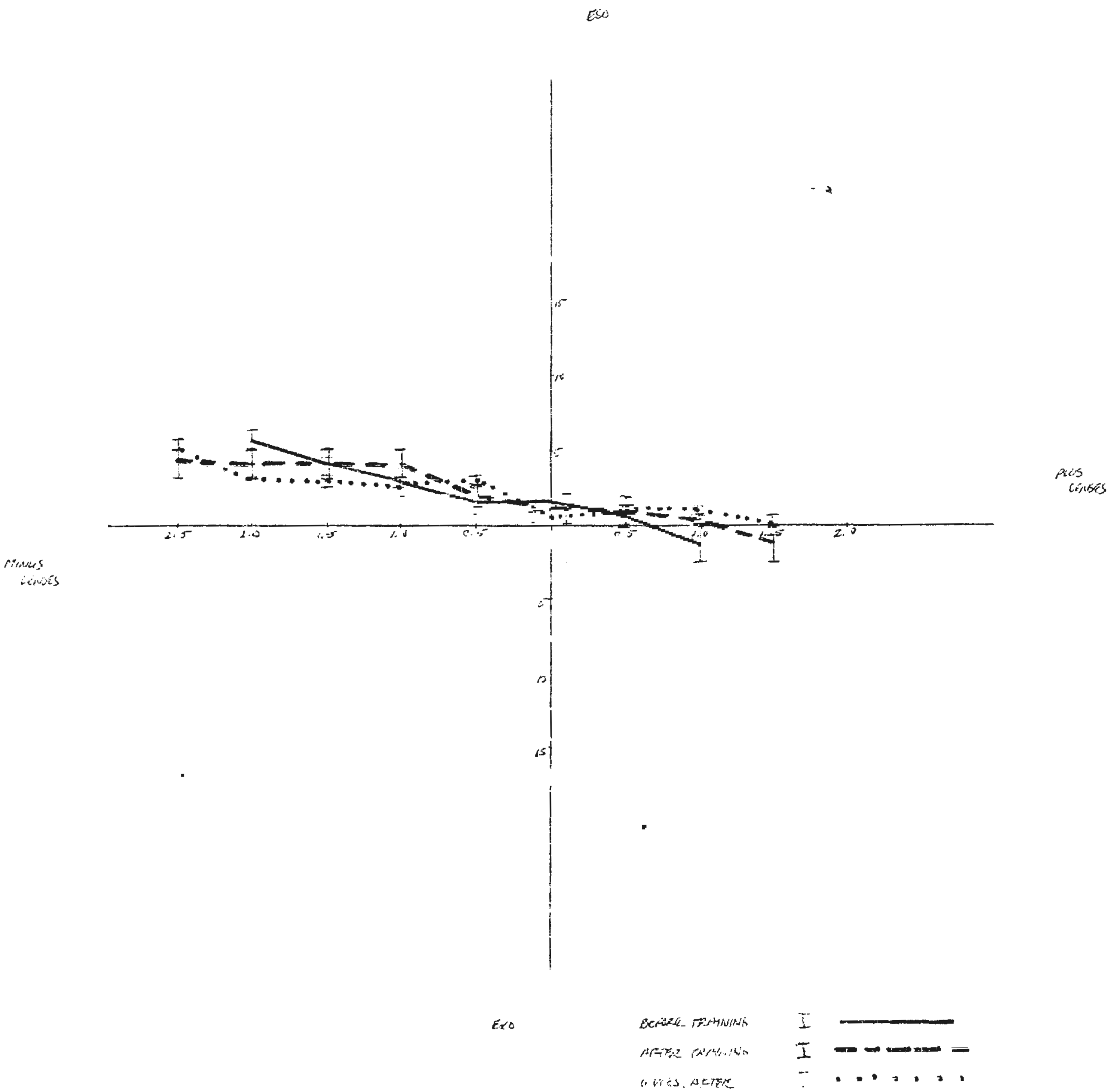
L.M.
PRISM @ 4.25M

NO. 3



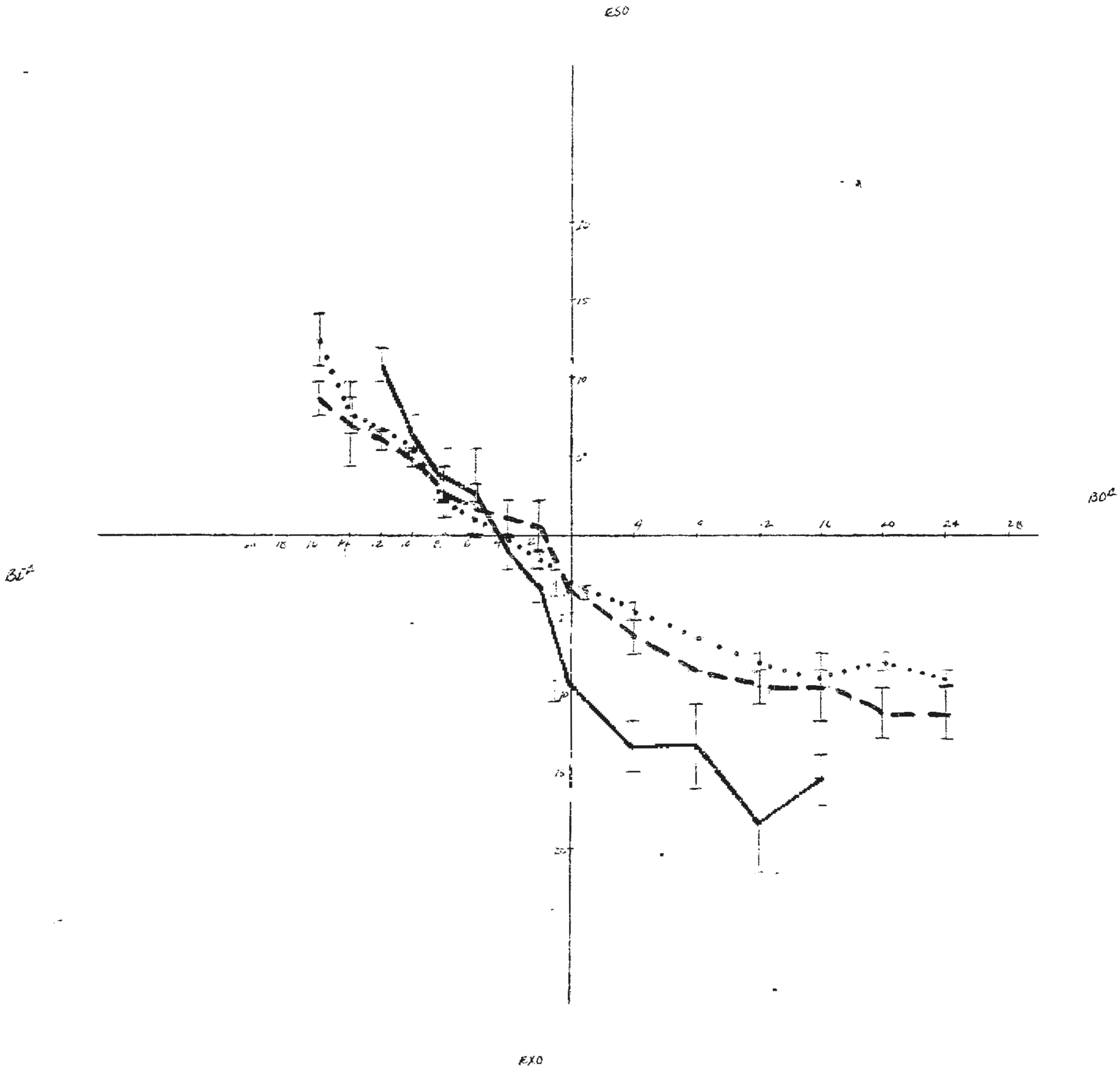
C.M.
LENSES @ 4.25 M

NO. 3



L.M.
PRISM @ 40 CM

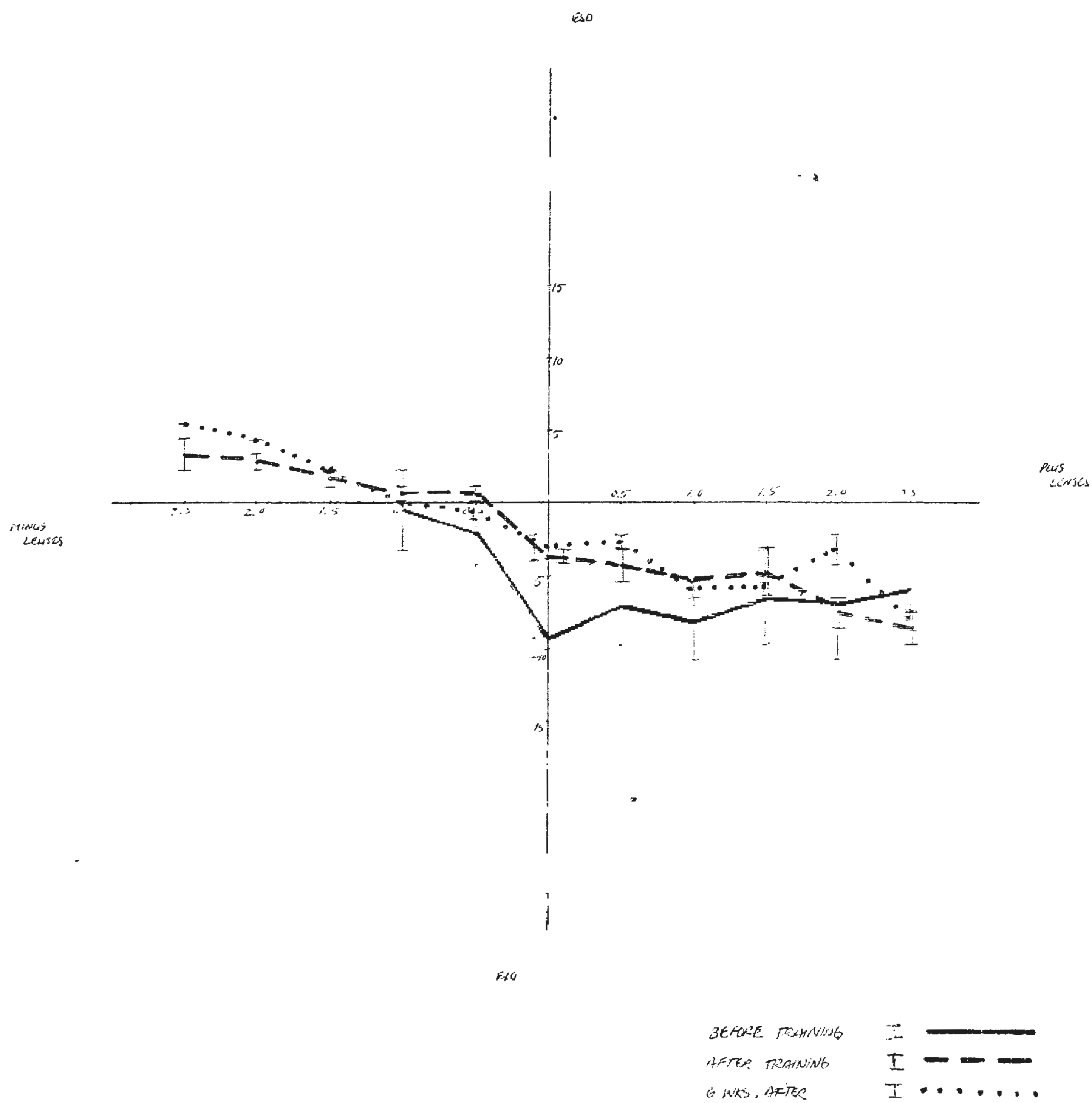
NO. 3



BEFORE TRAINING
AFTER TRAINING
6 WKS. AFTER

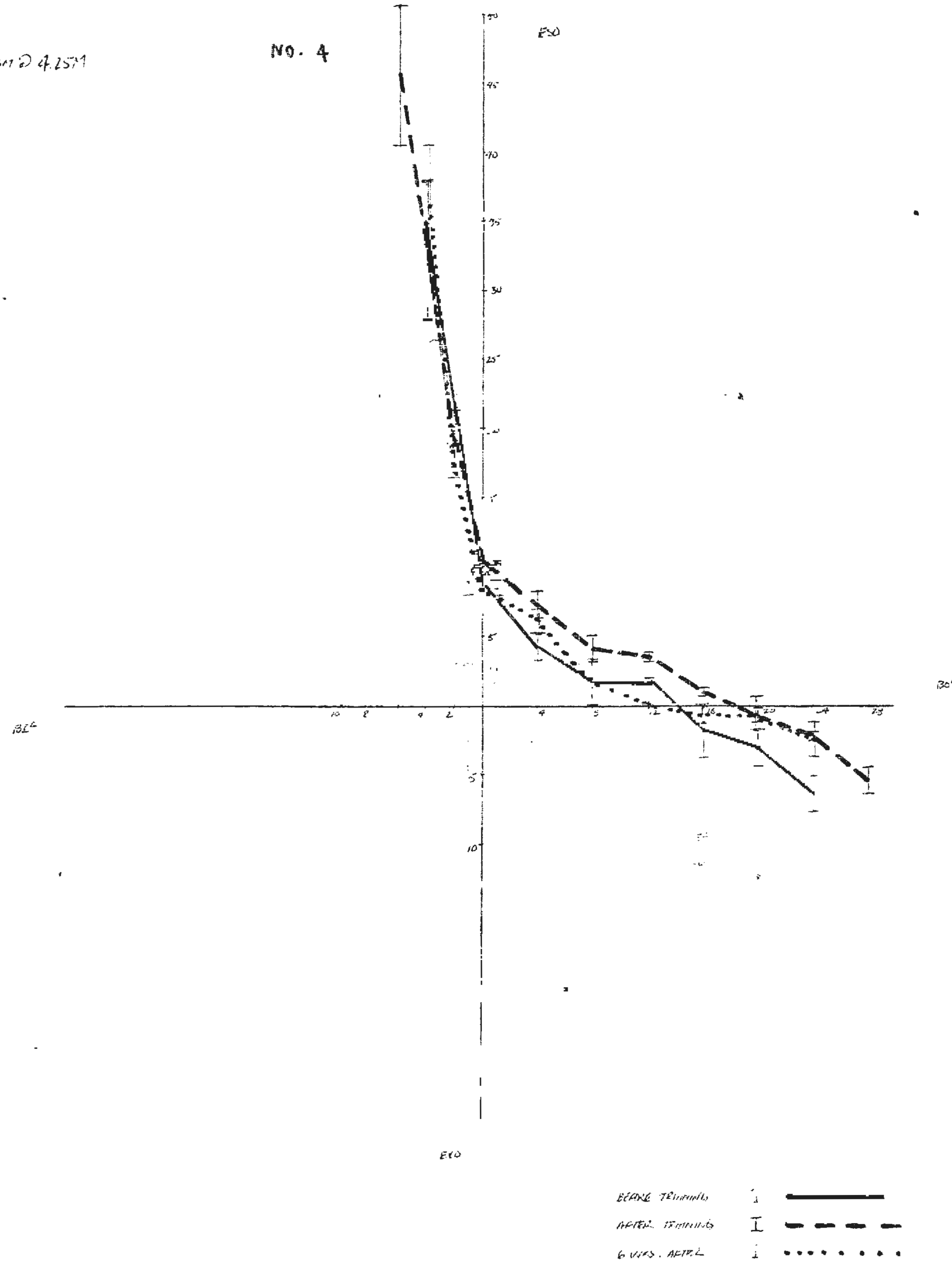
C.M.
LENSES @ 40CM

NO. 3



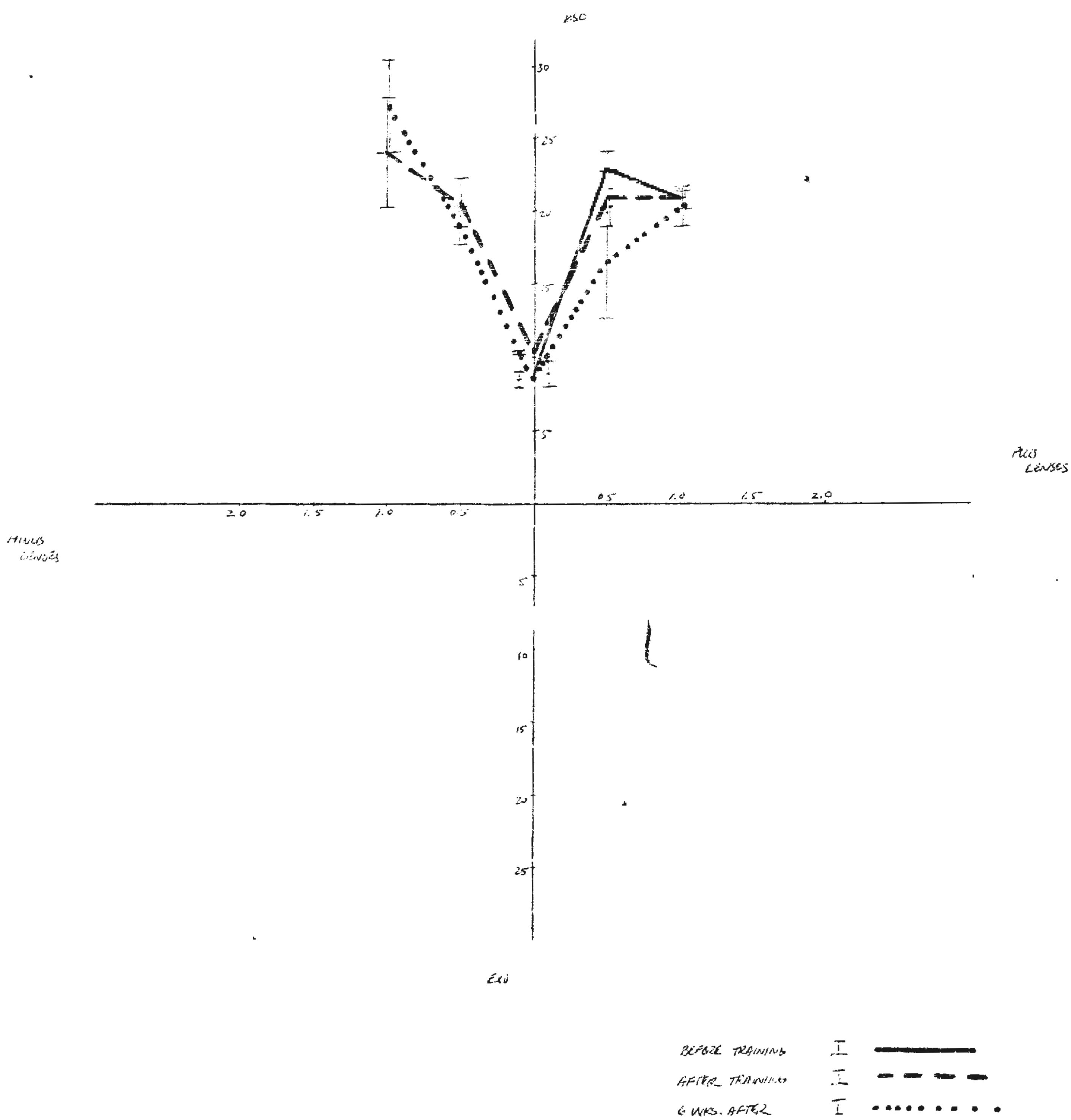
R.L.
PRISM @ 4.25M

NO. 4



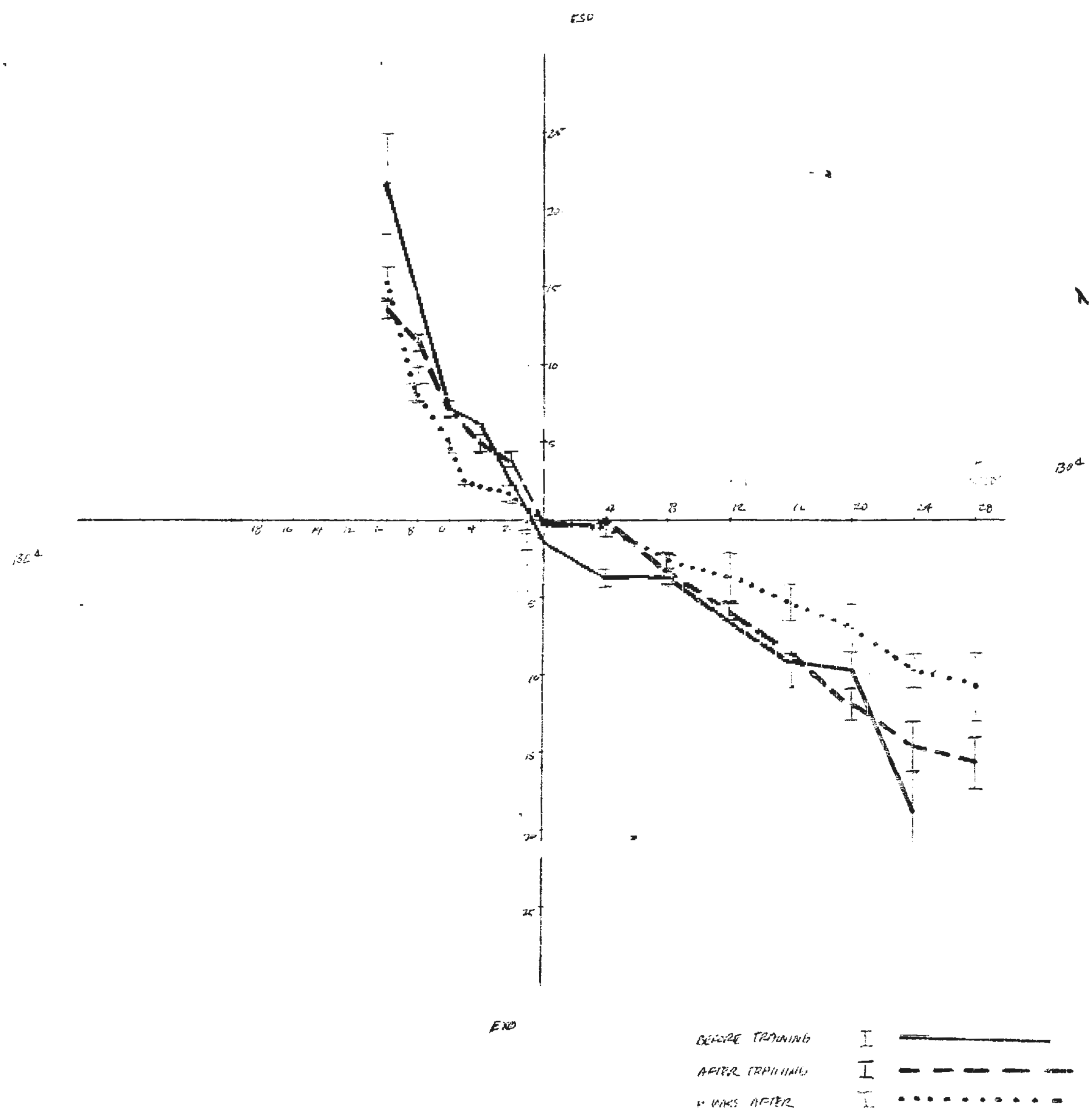
R.L.
LENSES @ 425M

NO. 4



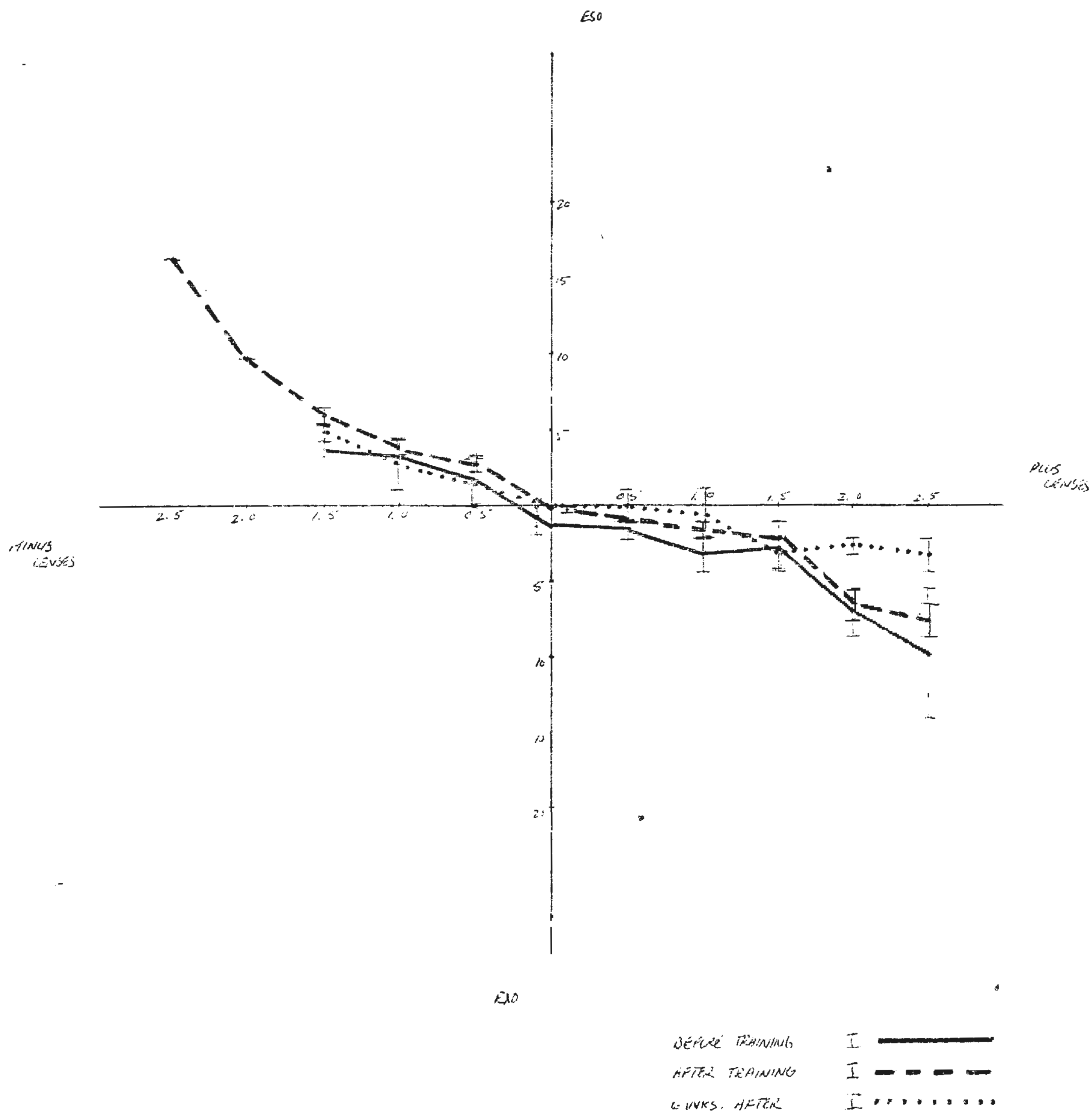
R.L.
PRISM @ 40 CM

NO. 4



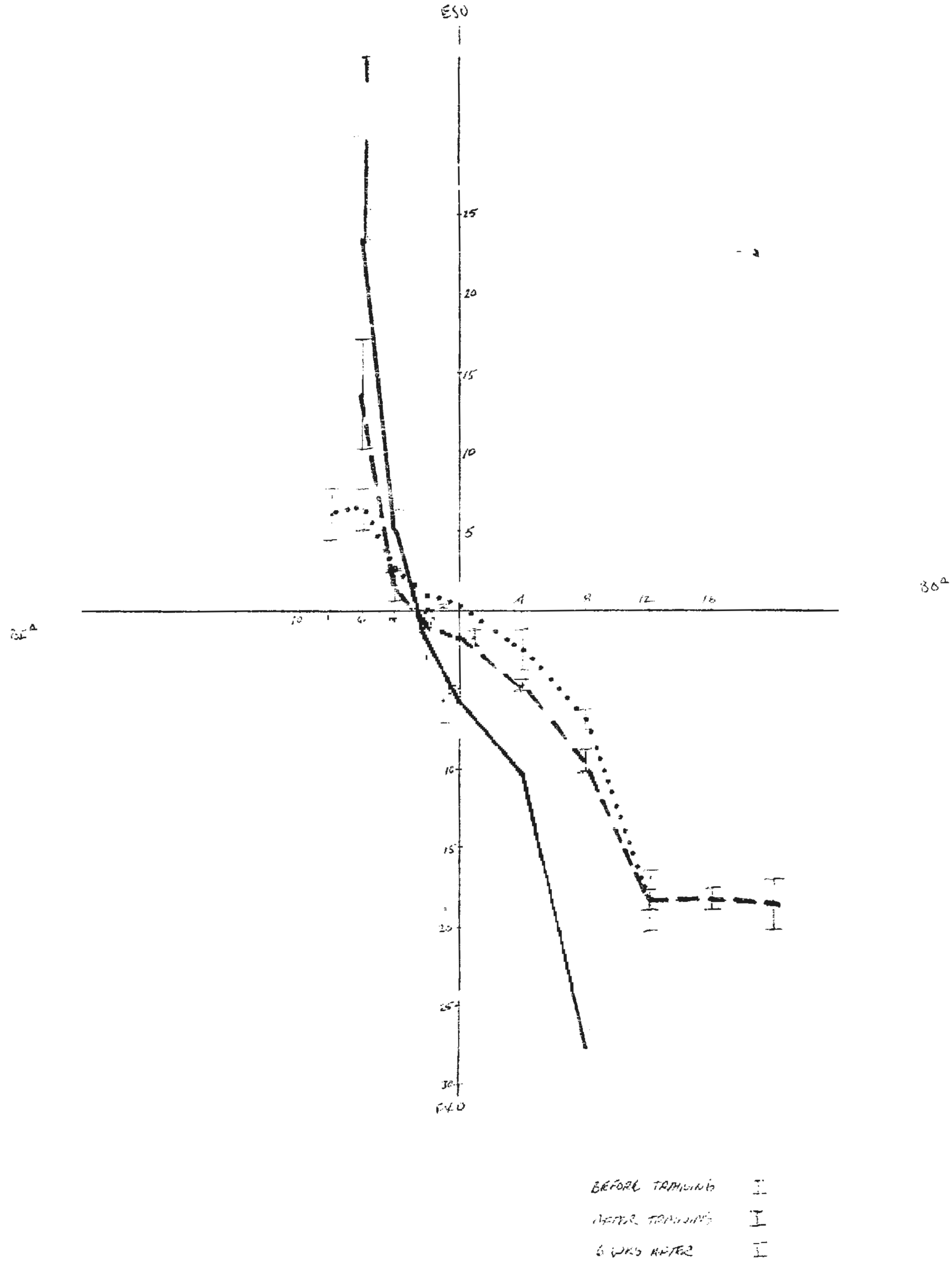
R.L.
LENSES @ 40 CM

NO. 4



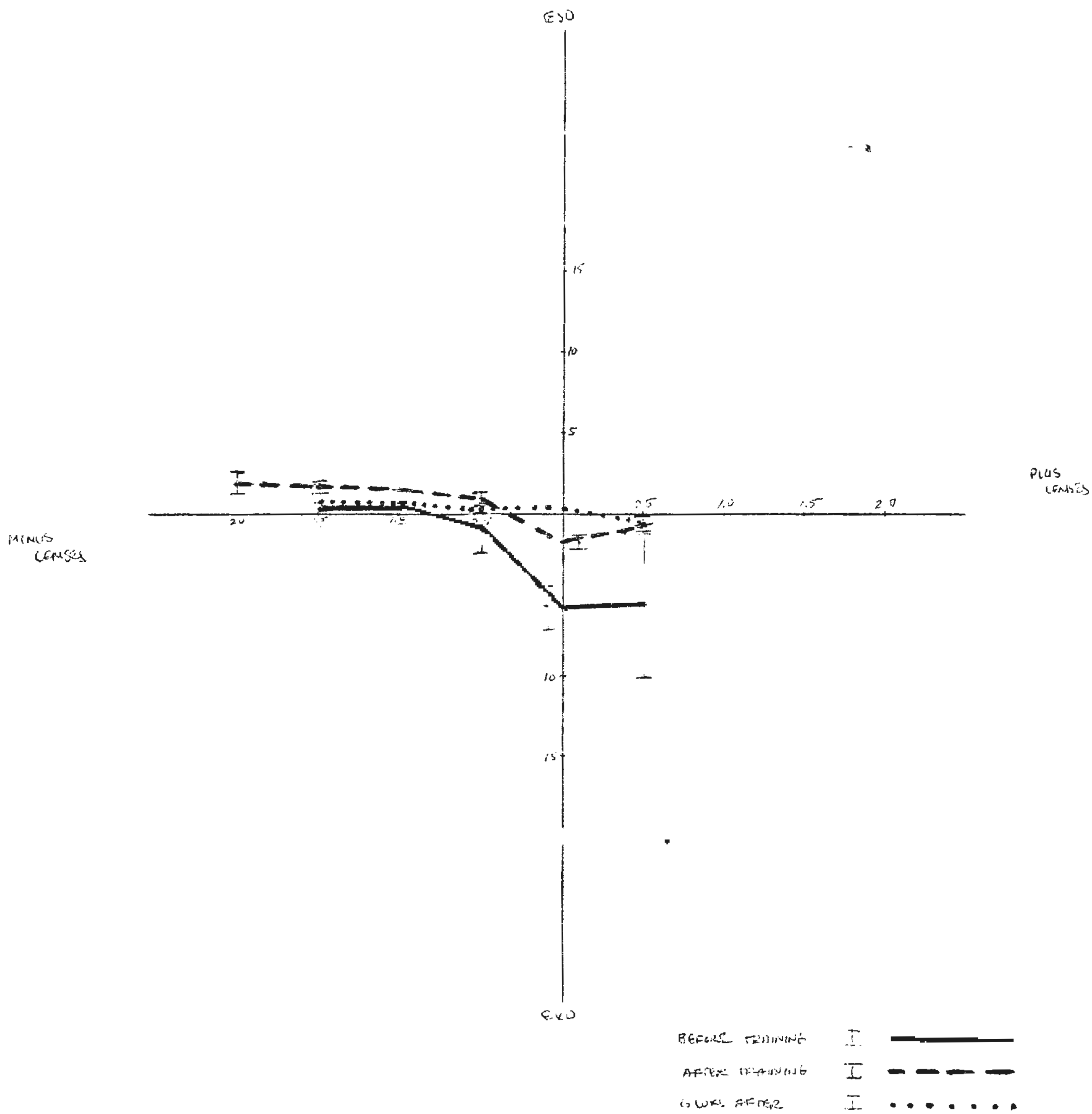
STEVE SHAFFER
PRISM @ 4.5 M

NO. 5



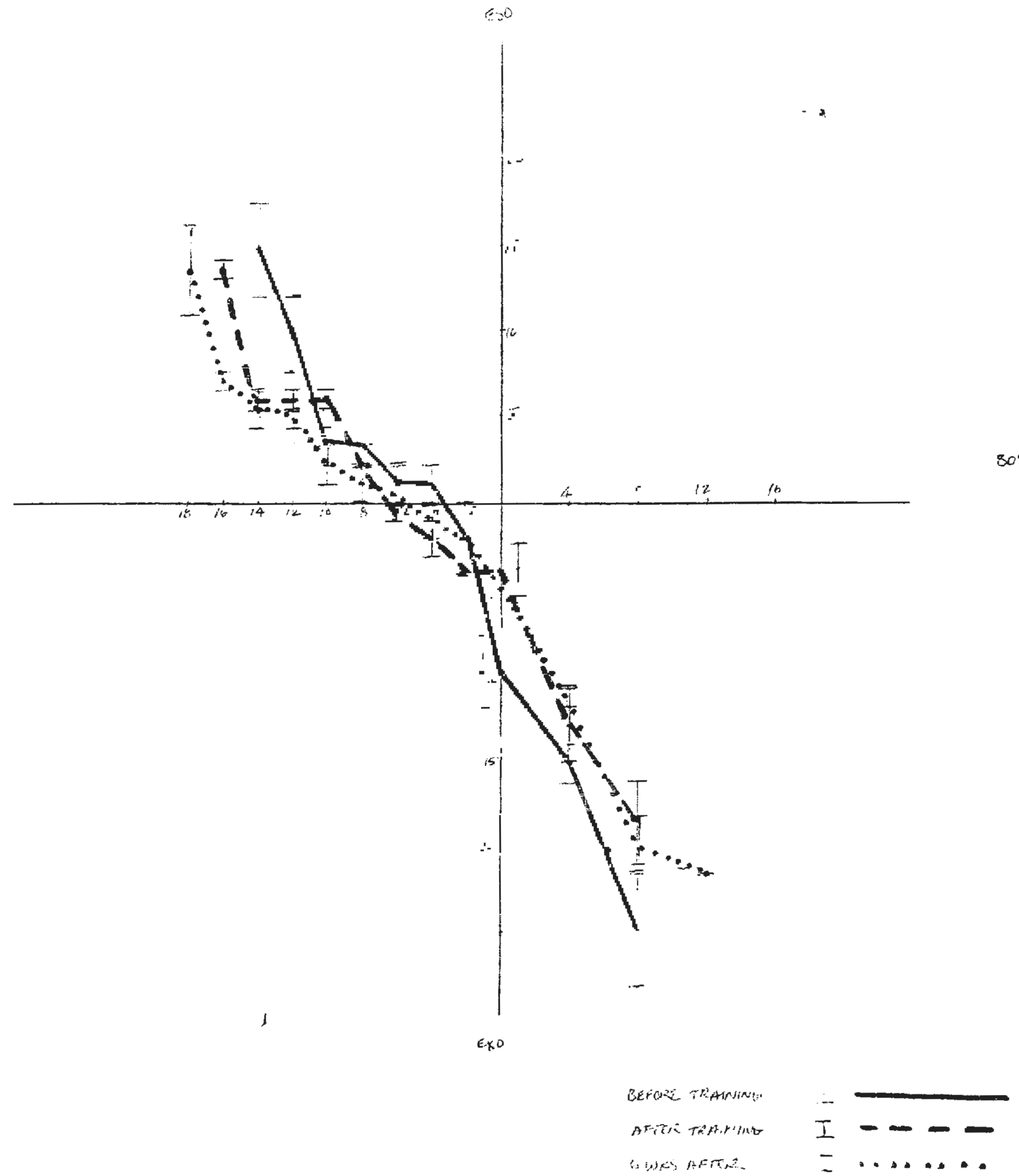
STEVE SHAFFER
LENSES @ 4.5M

NO. 5



STEVE SHAFFER
PRISM @ 40 CM

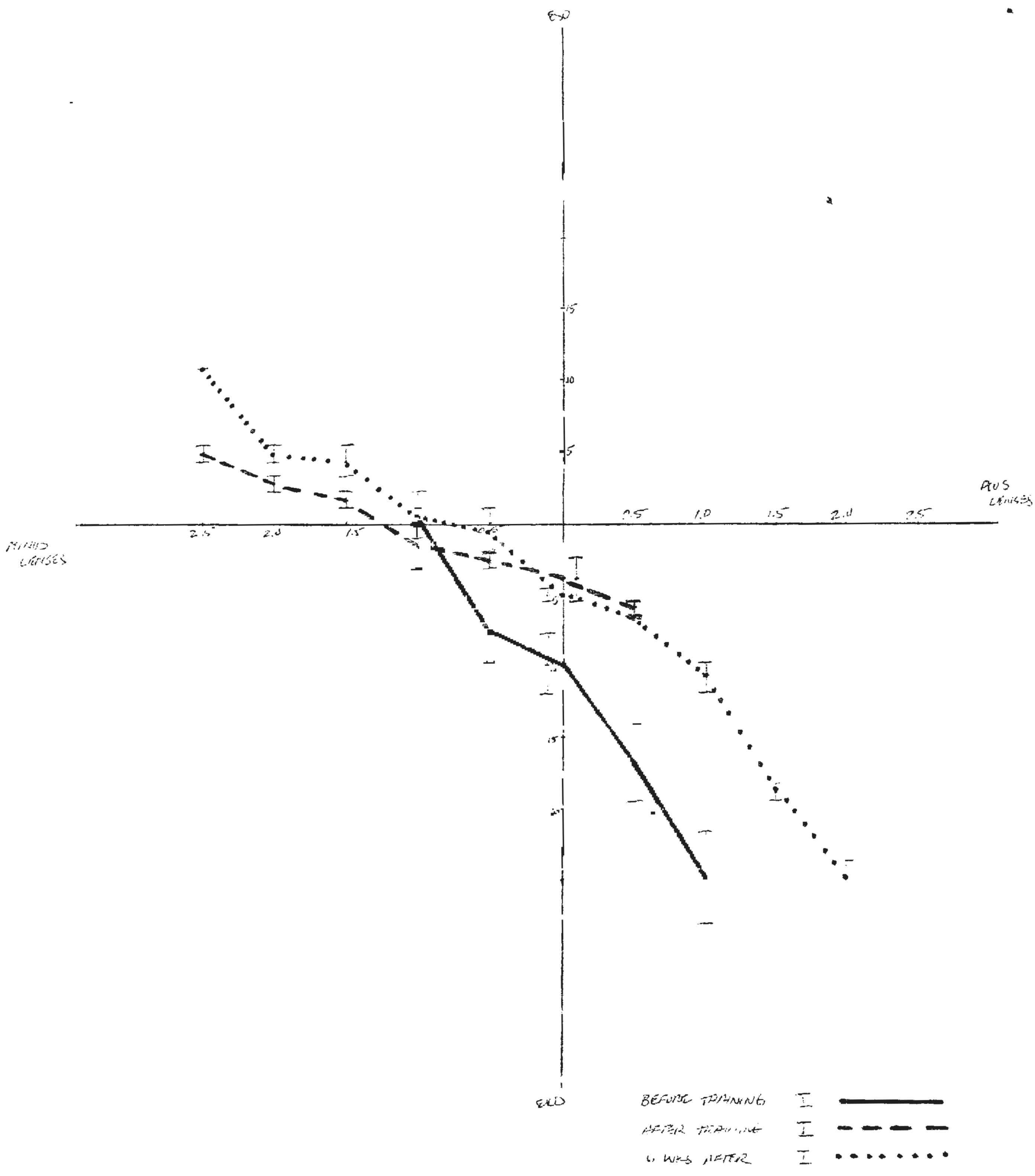
NO. 5



STEVE SHAFFER

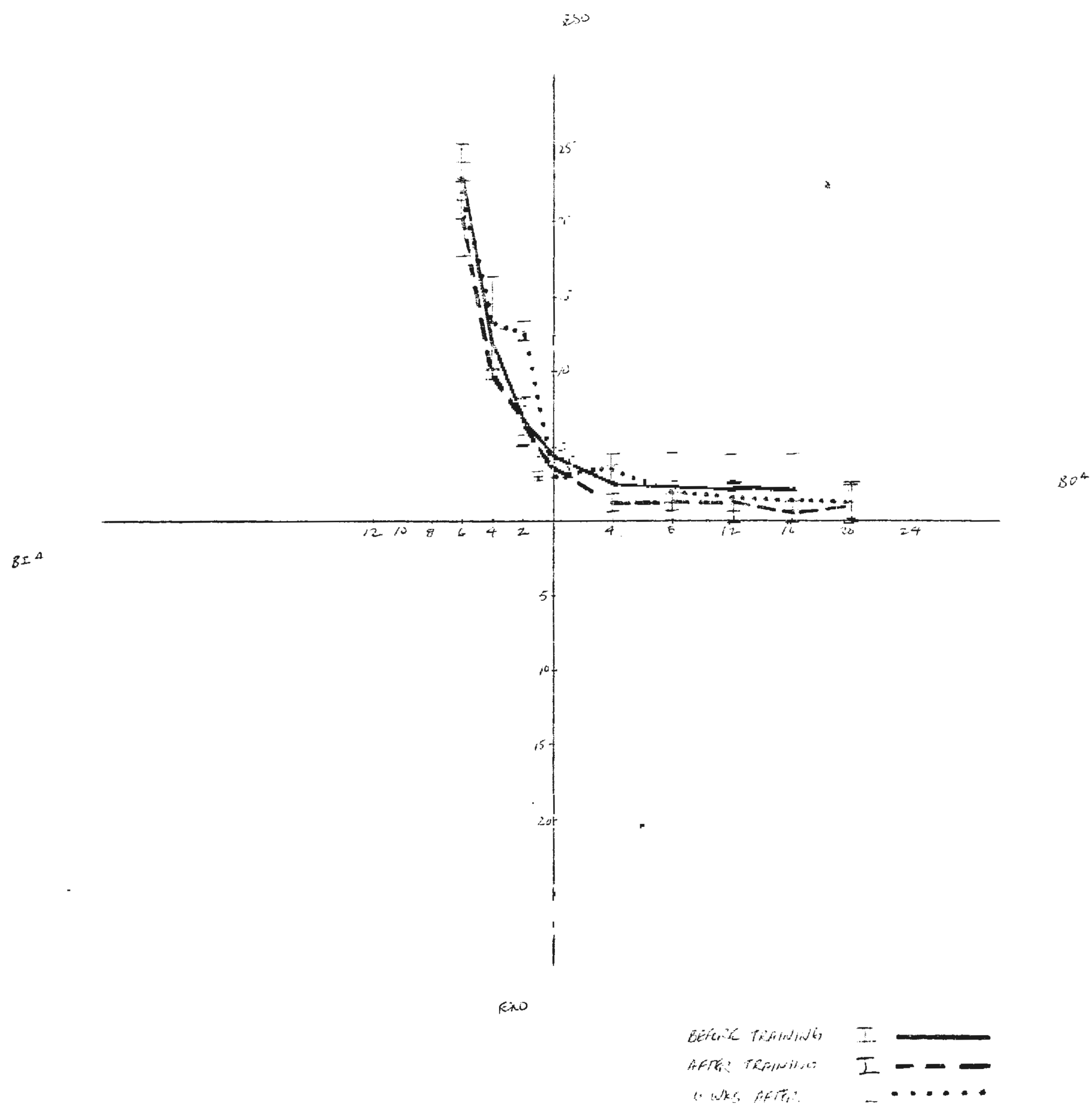
LENSES @ 40 CM

NO. 5



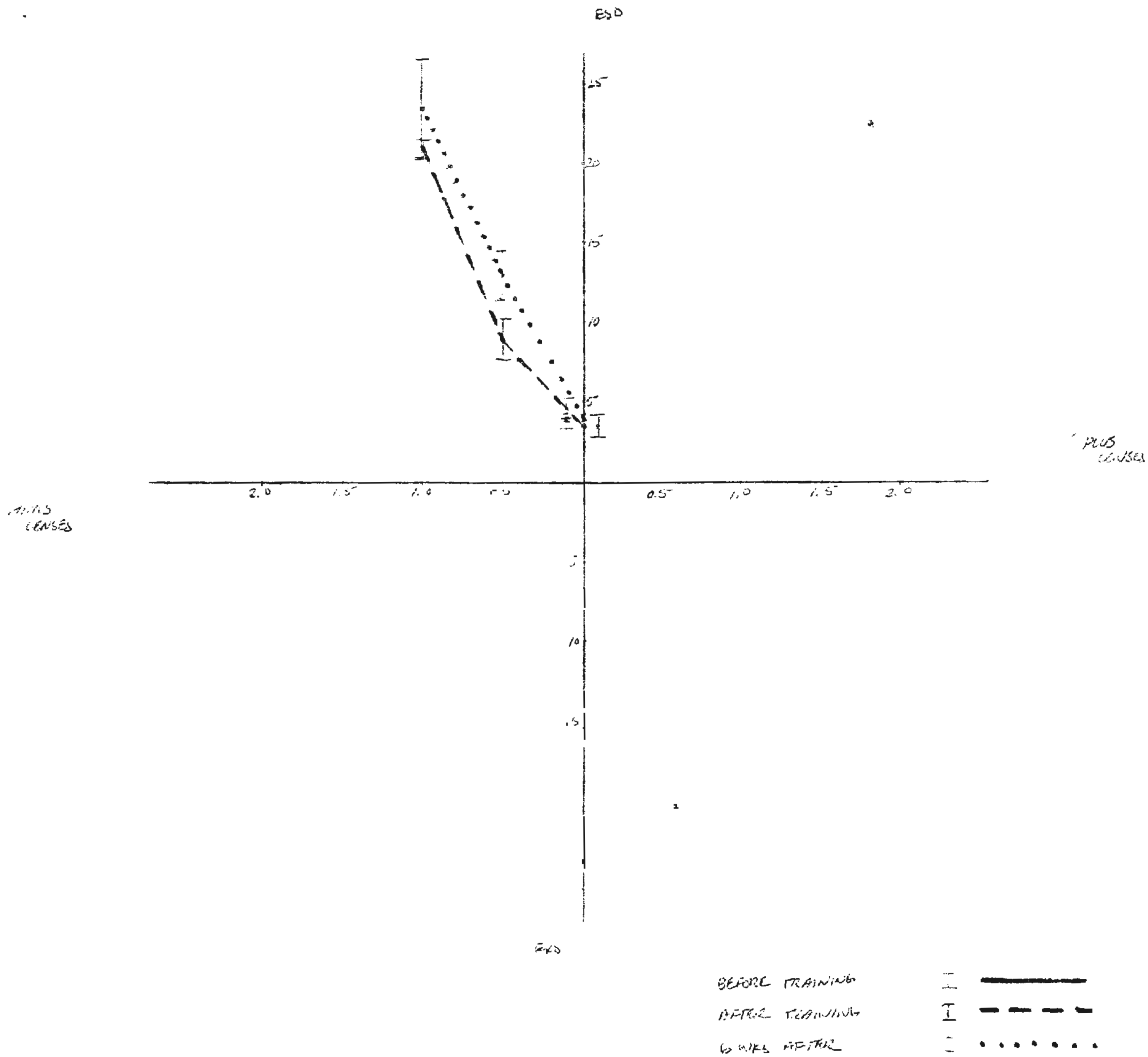
JOYCE NELSON
PRISM 6, 4.5M

NO. 6



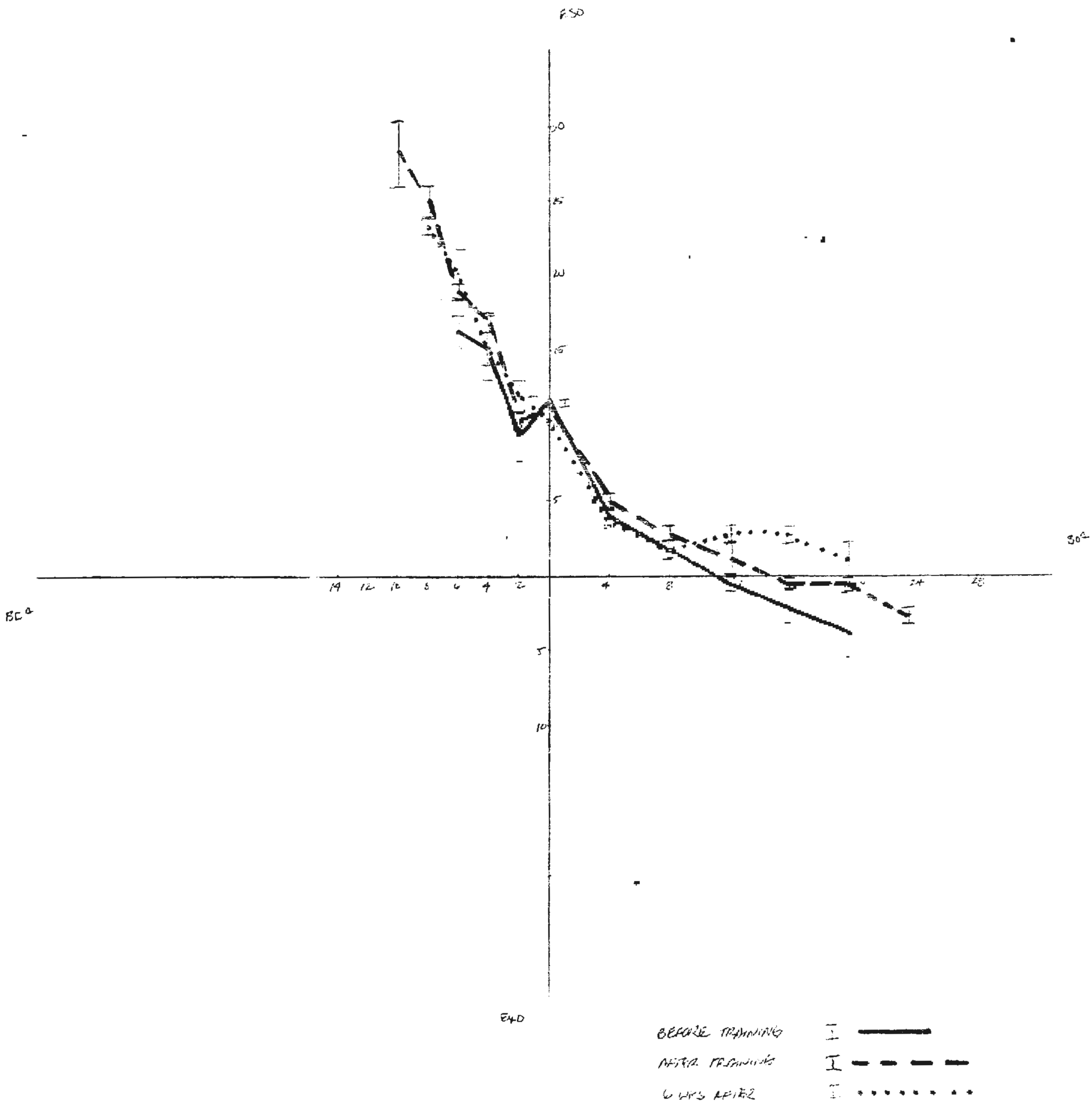
JOYCE NELSON
LENSES @ 4.5 M

NO. 6



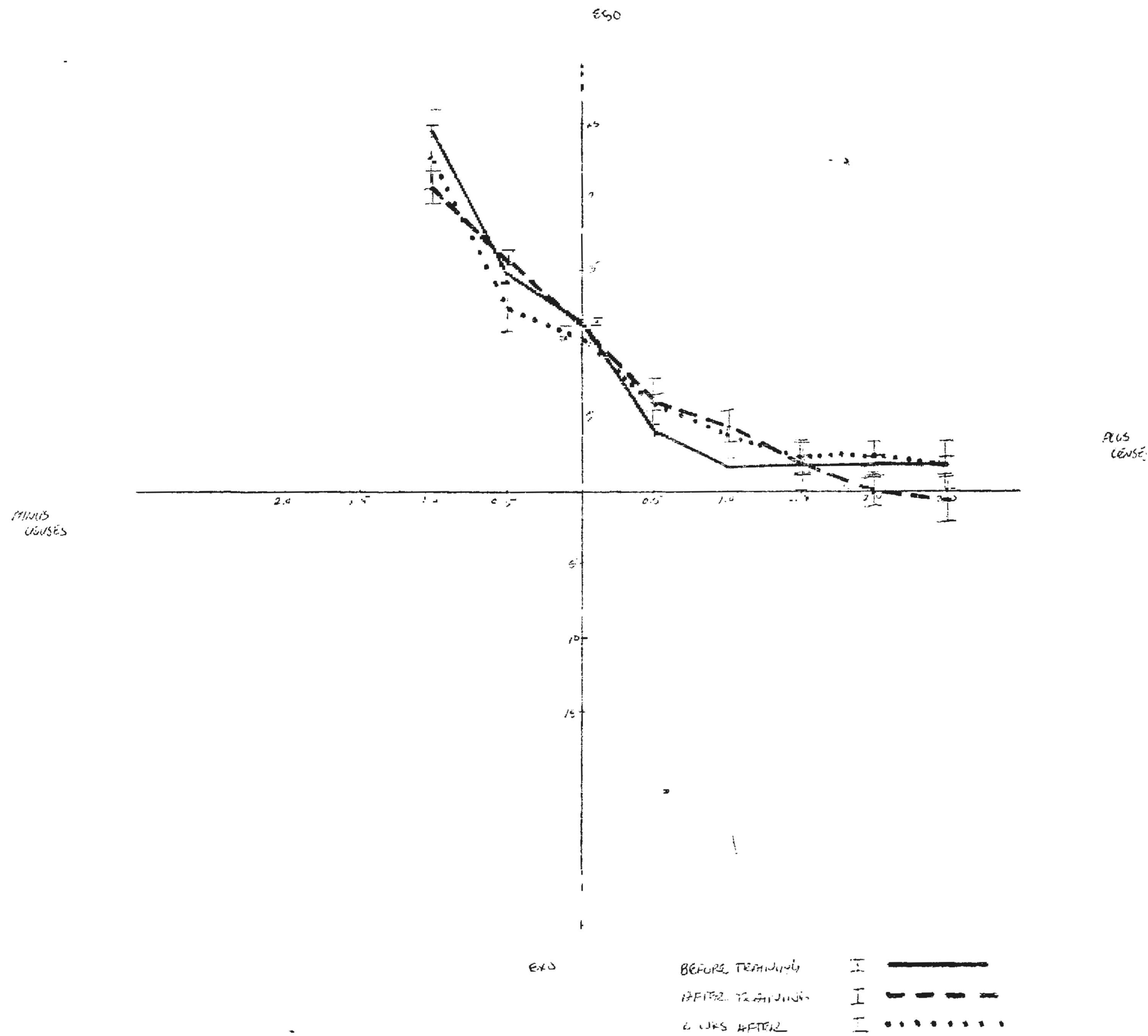
J. N.
PRISM a' 40CM

NO. 6



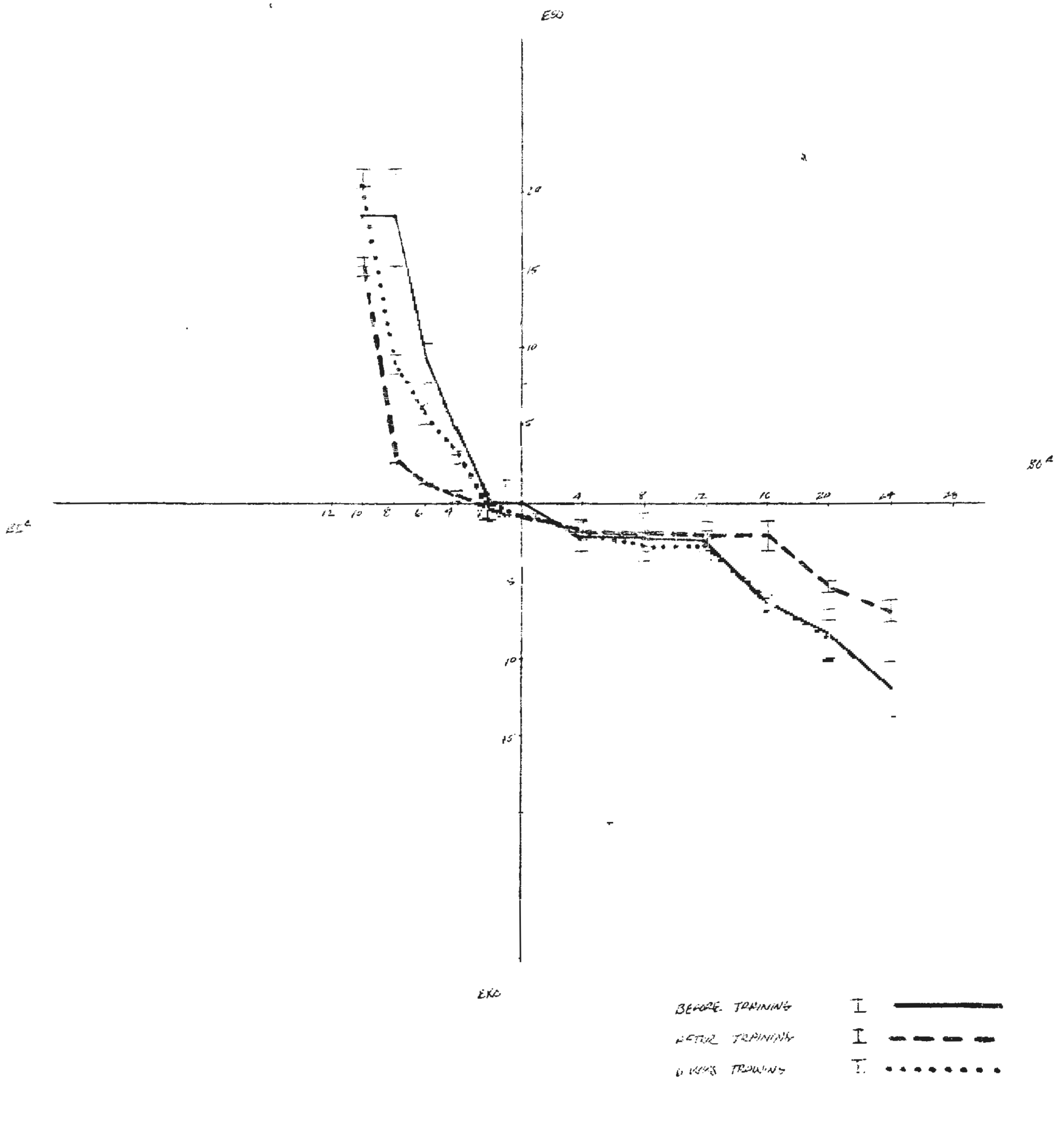
JOYCE NELSON
LENSES @ 40 CM

NO. 6



S.N.
PRISM 6 4.25 M

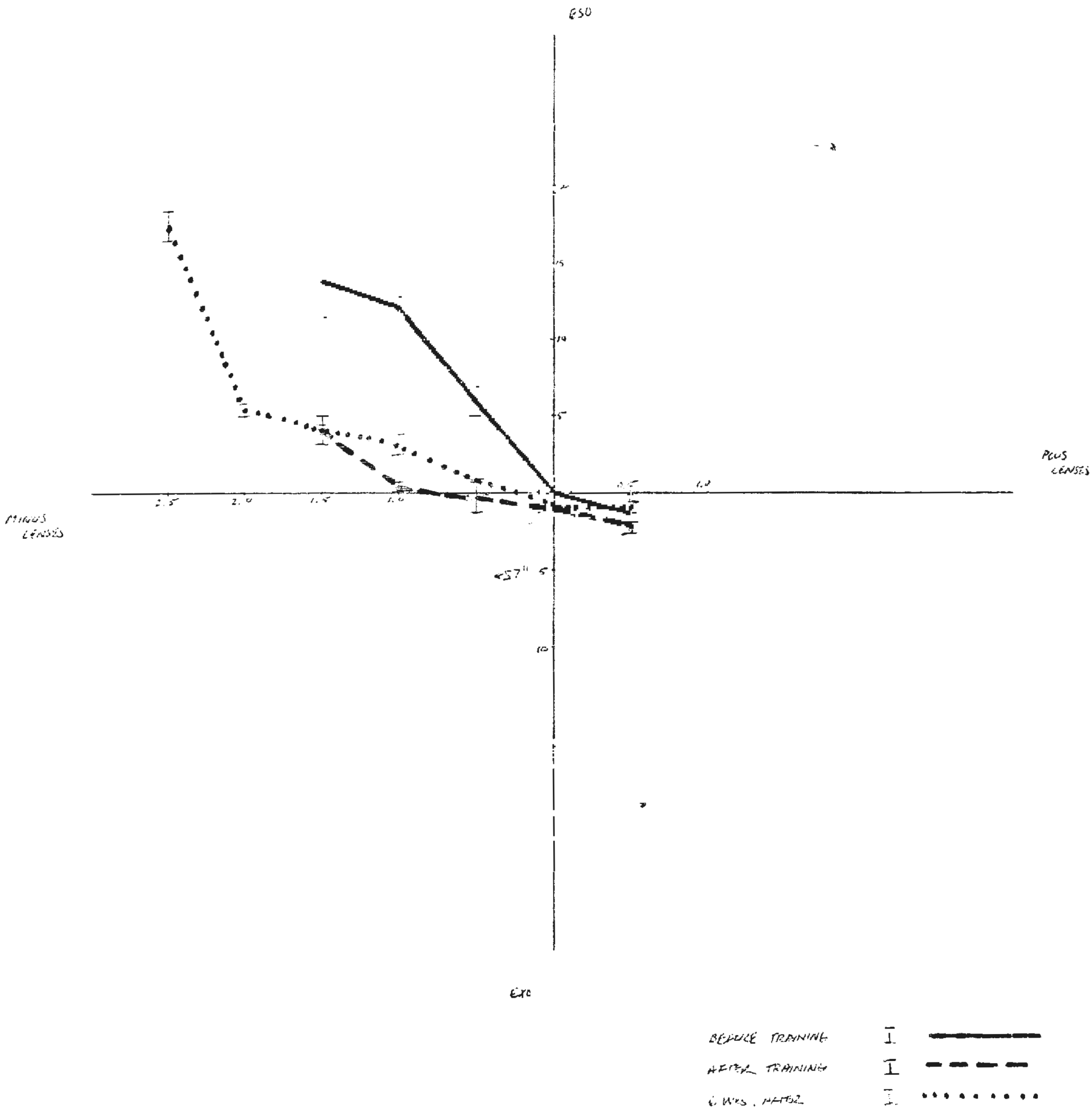
NO. 7



S.N.

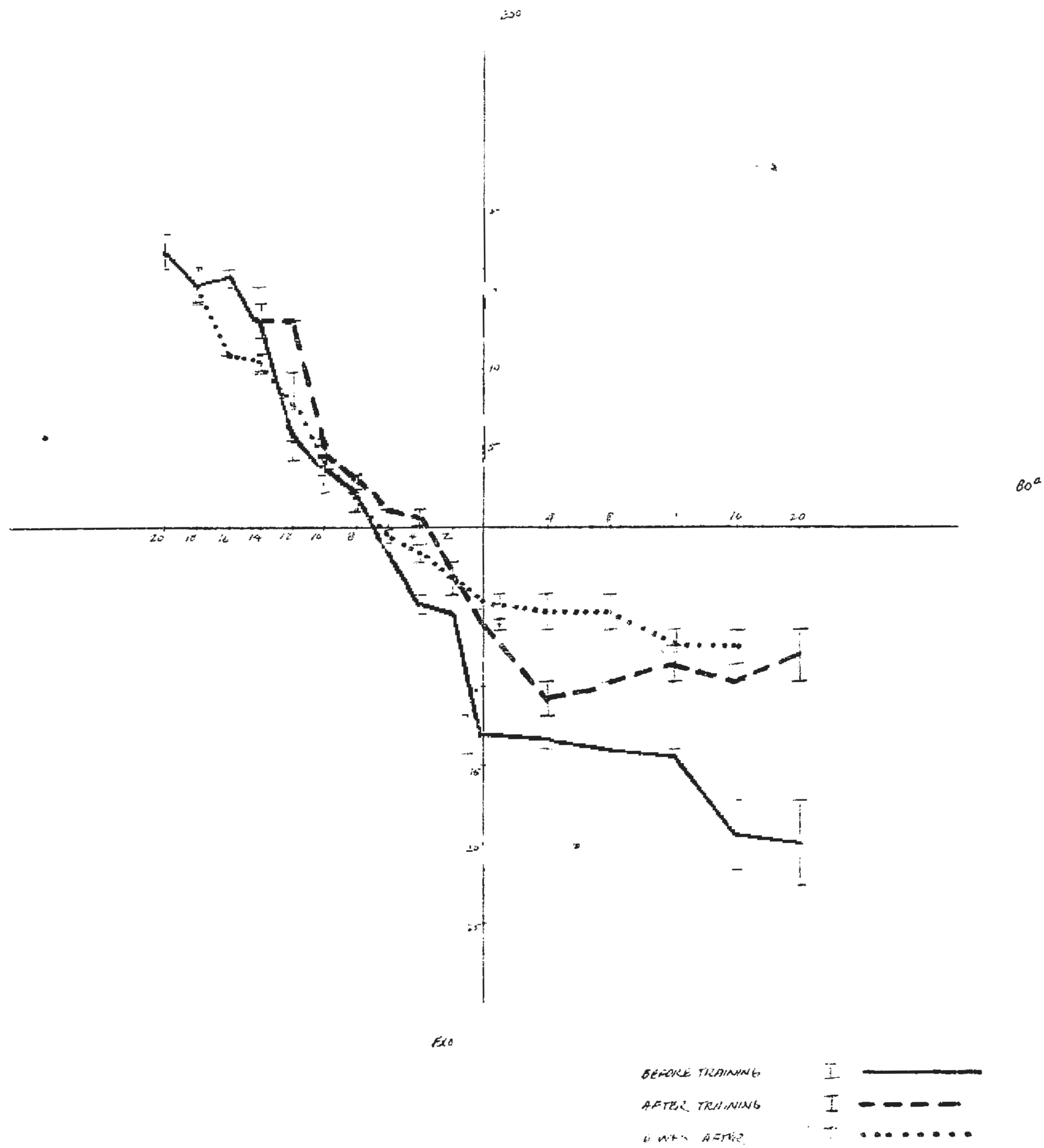
LENSES @ 4.5 M

NO. 7



S.N.
PRBM @ 40cm

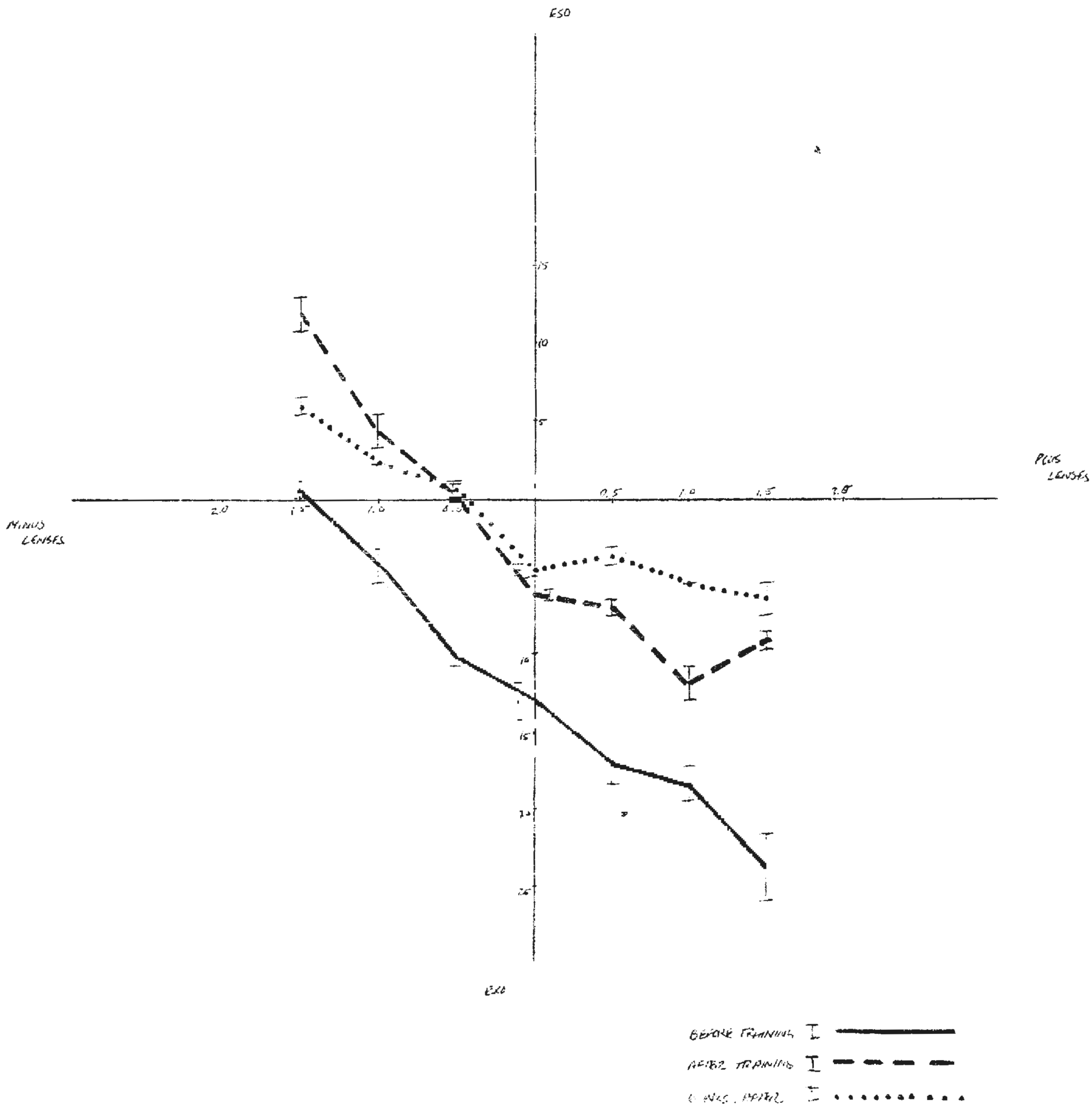
NO 7



S. N.

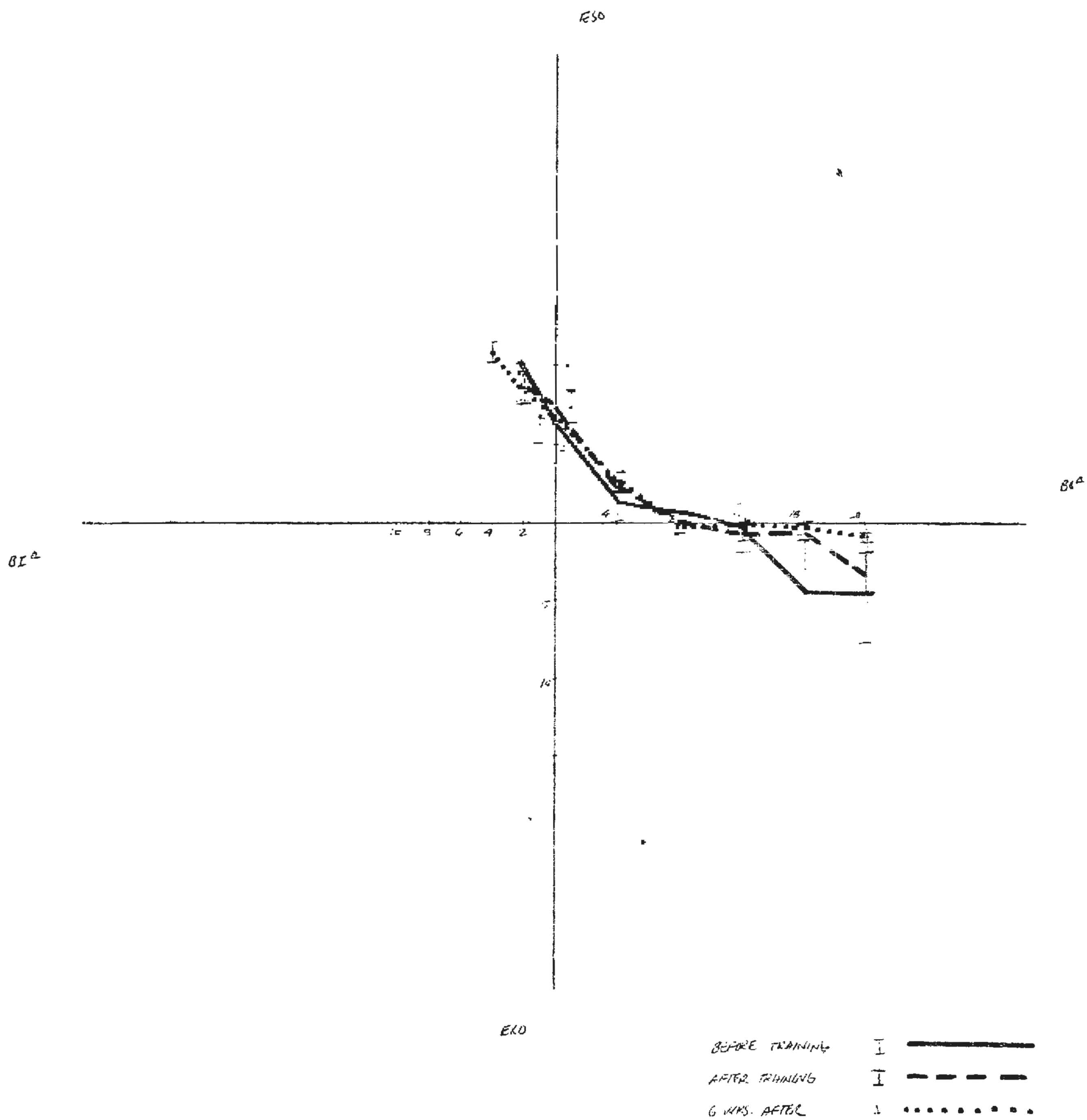
LENSES @ 40 CM

NO. 7



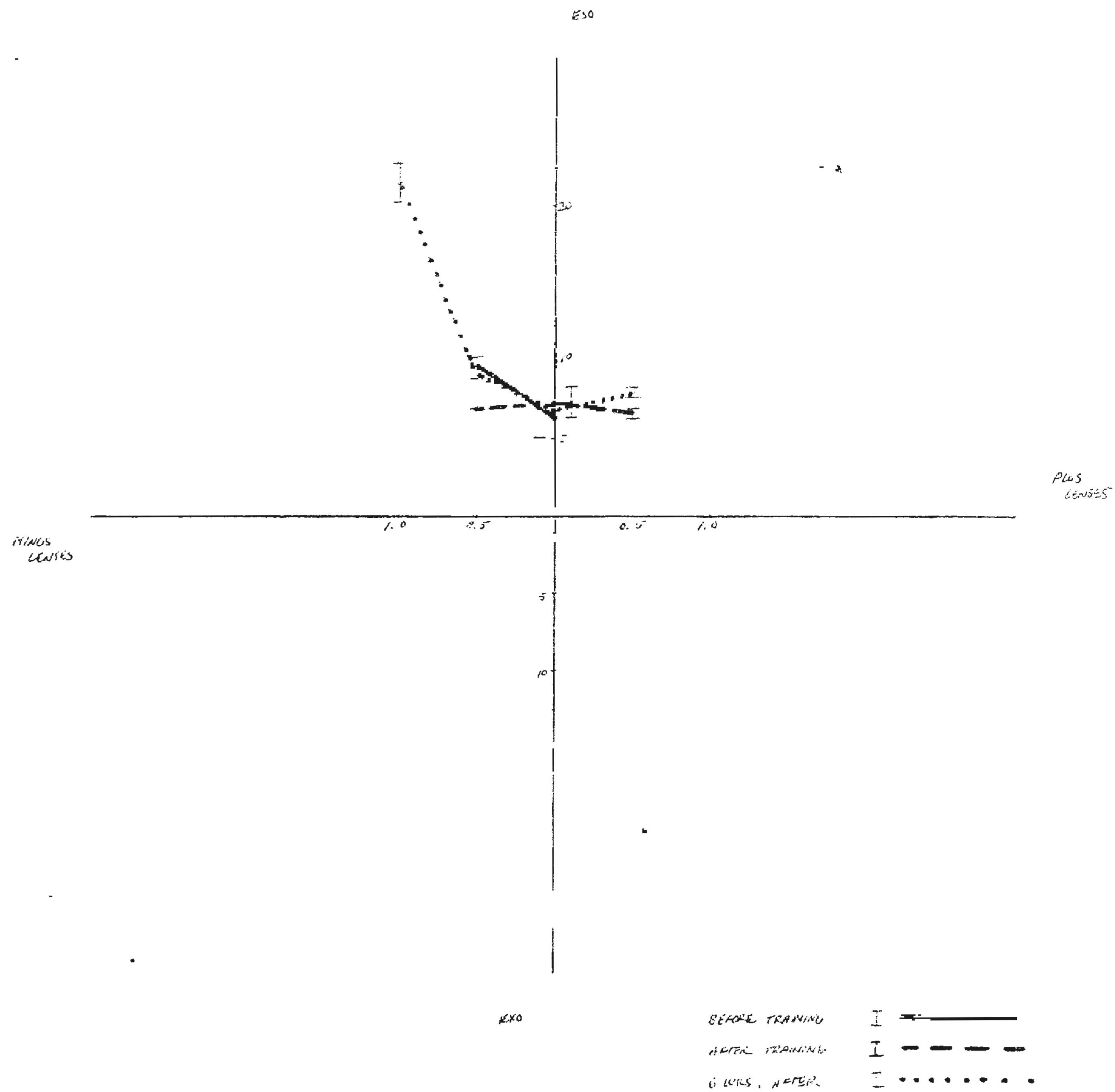
L. S.
PRISM @ 4.25M

NO. 8



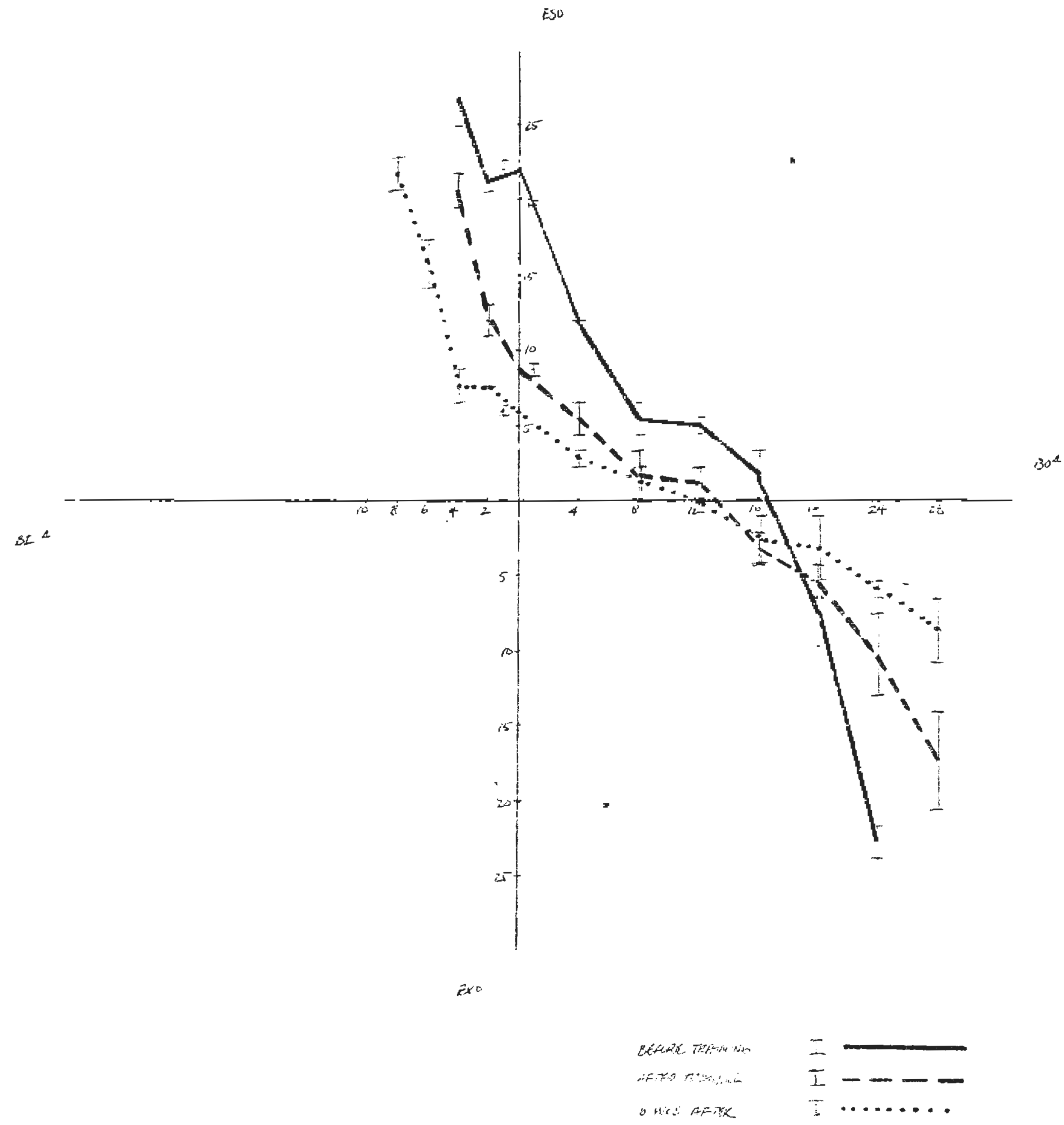
L. J.
LENSES @ 4.25"

NO. 8



L.J.
PRISM @ 40 CM

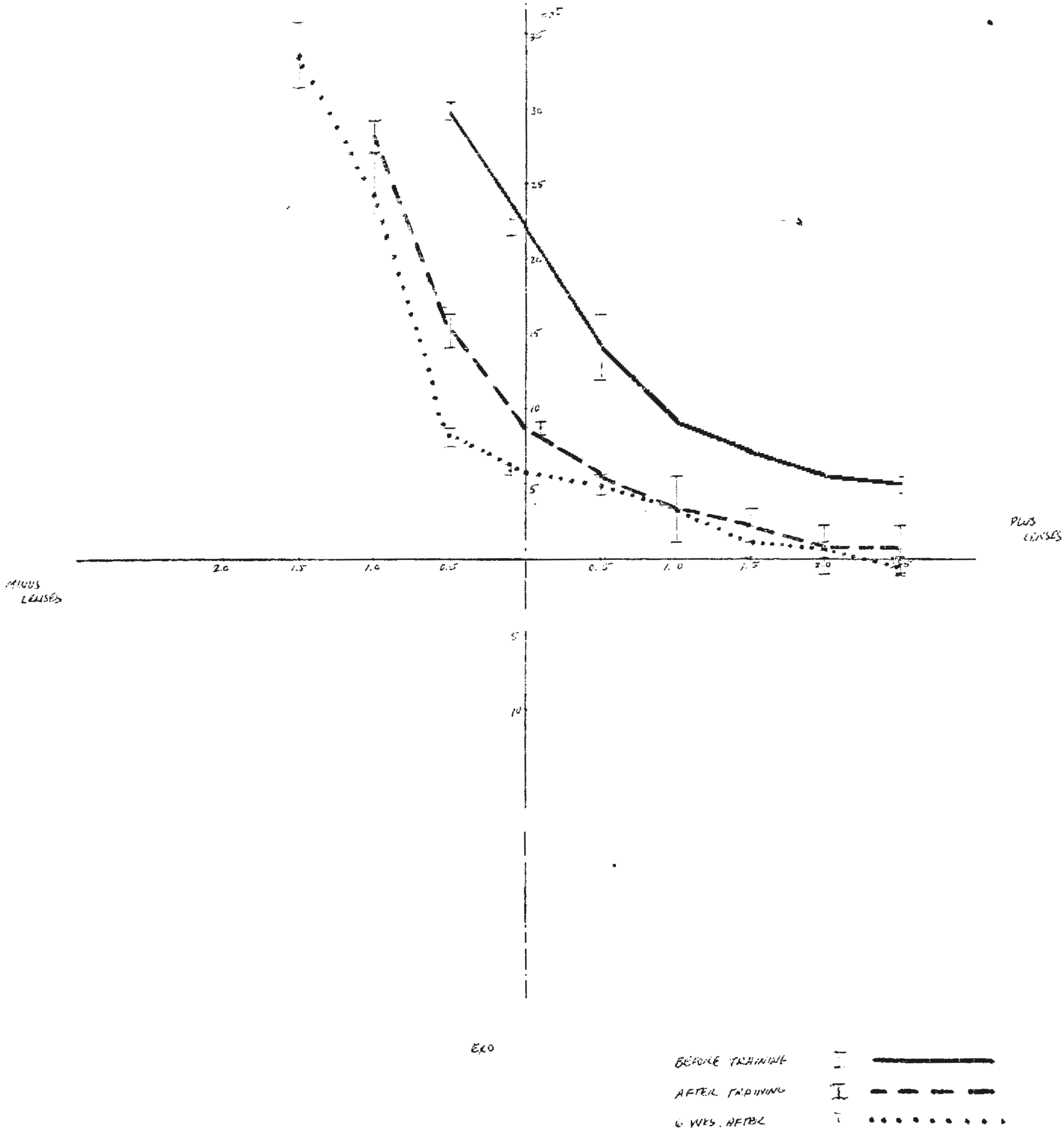
NO. 8



L.J.

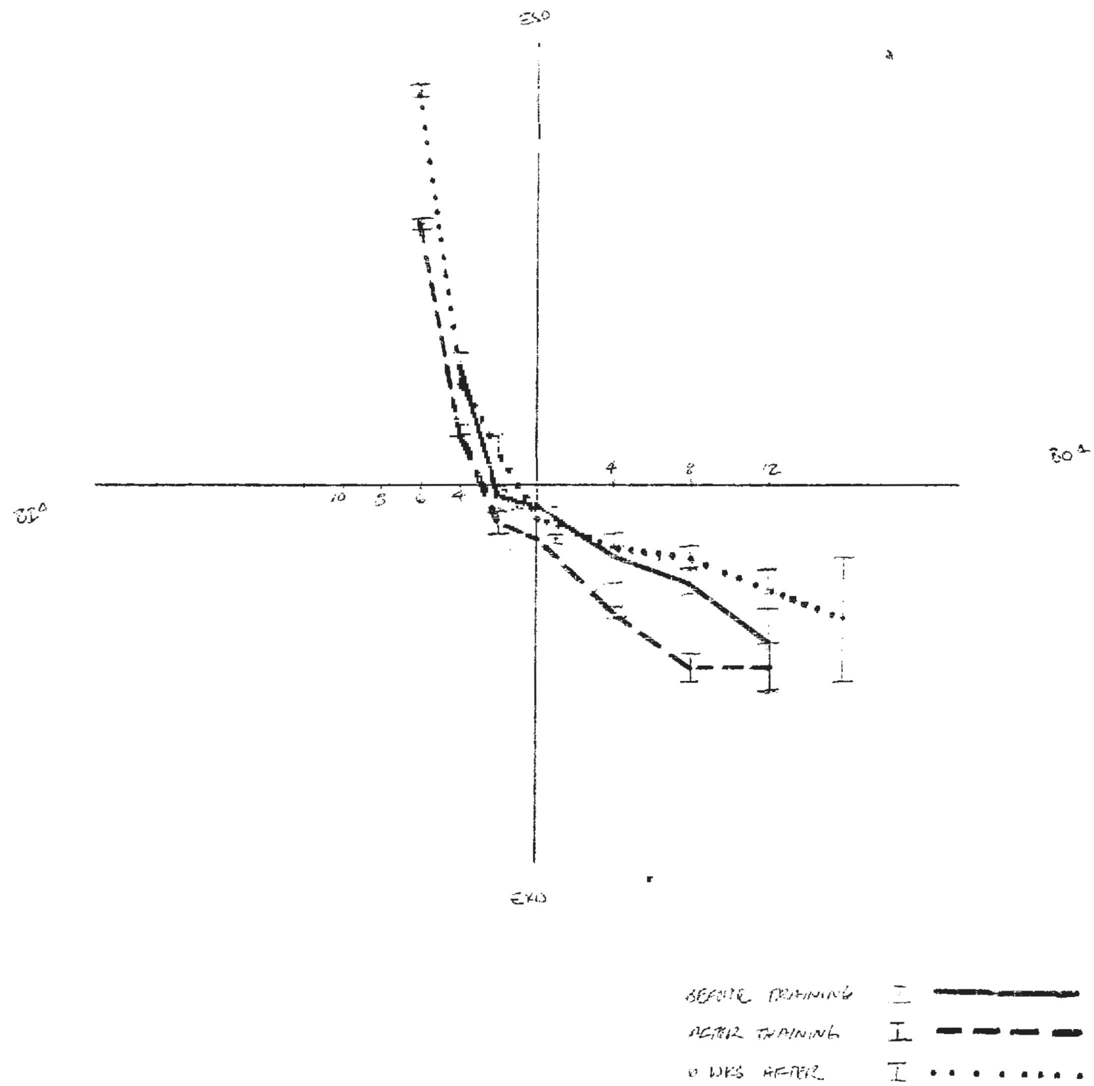
LENSES @ 40 CM

NO. 8



PATTY KELM
PRISM @ 405 M

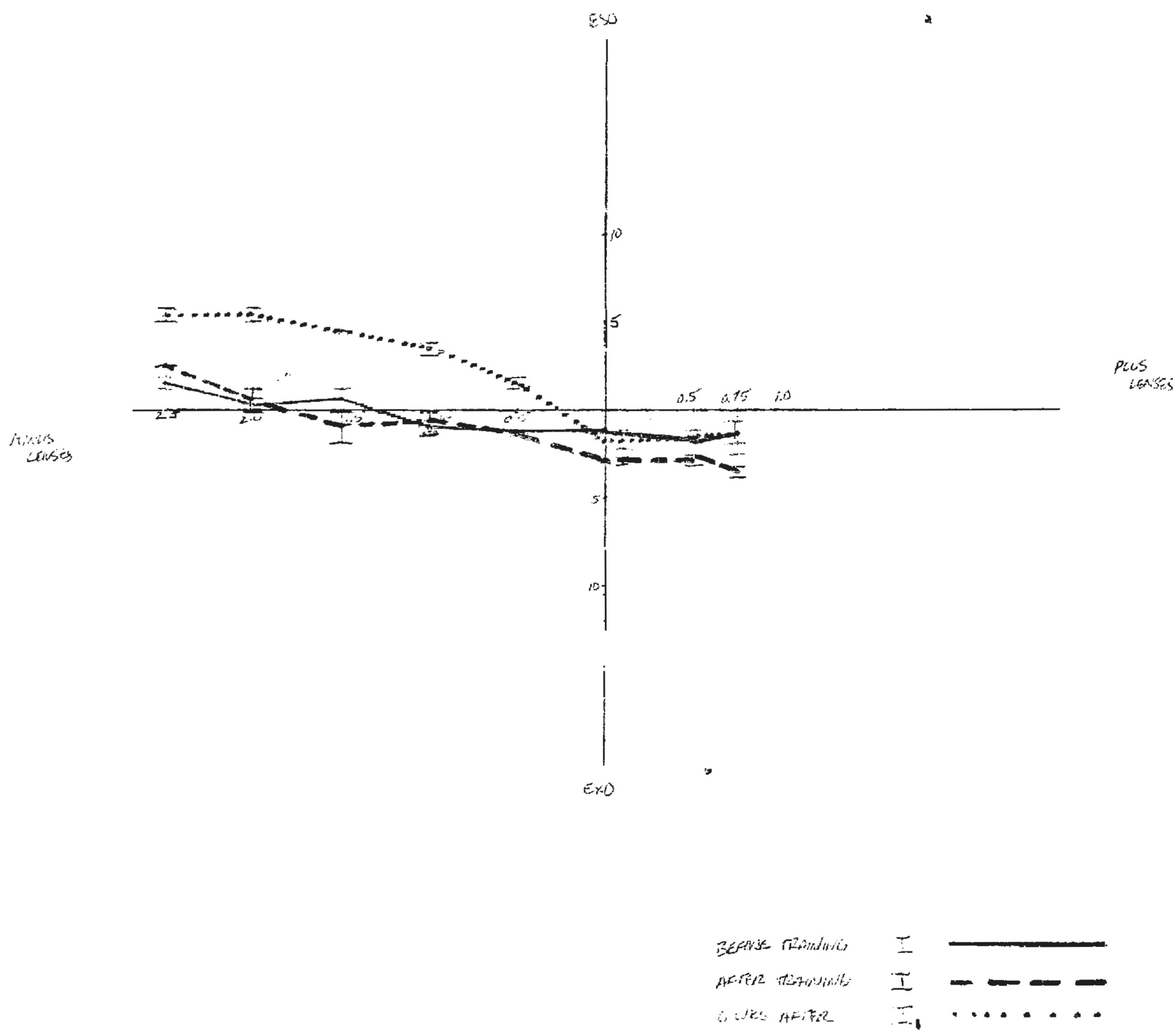
NO. 9



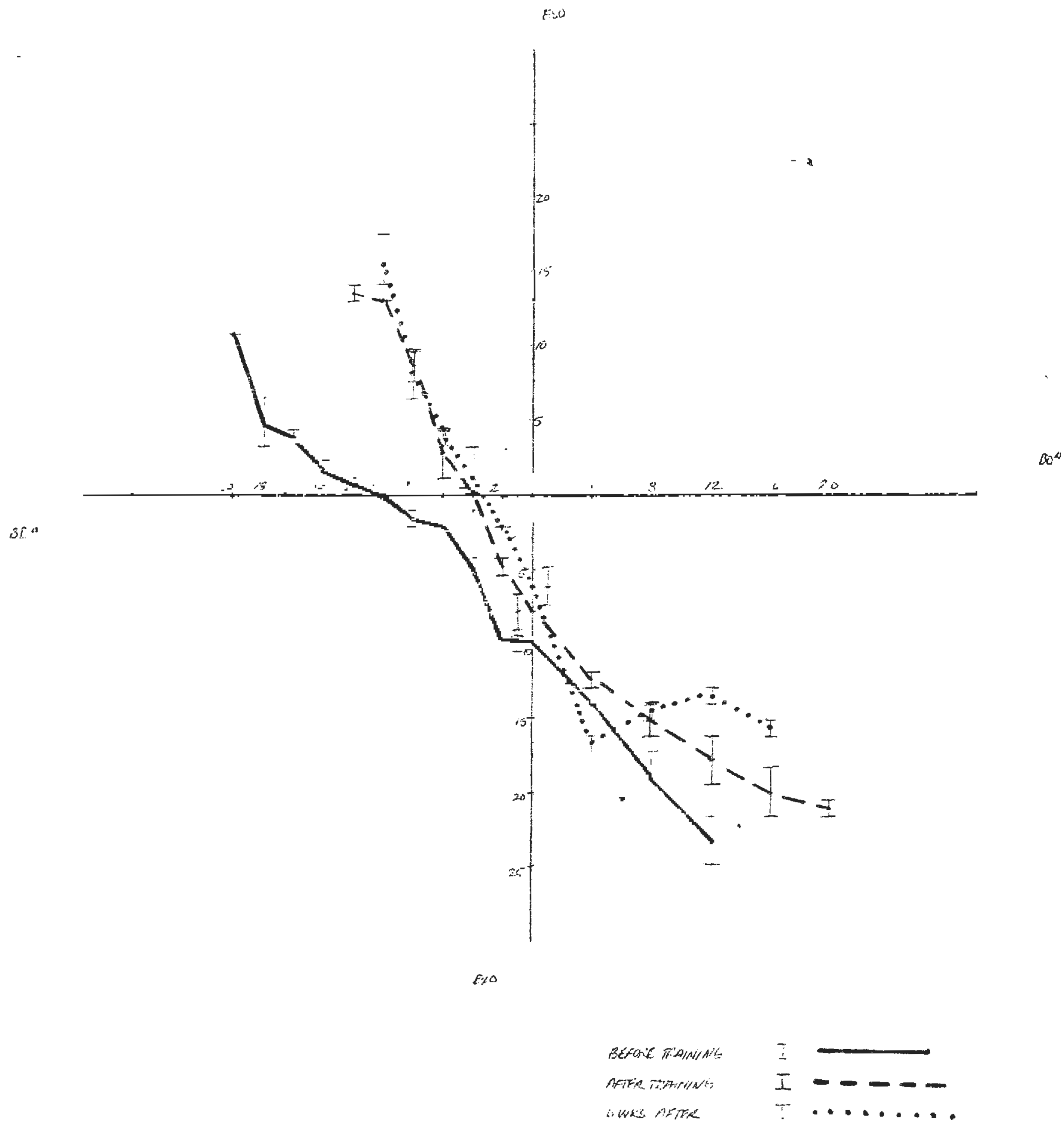
PATTY KELM

LENSES @.425 M

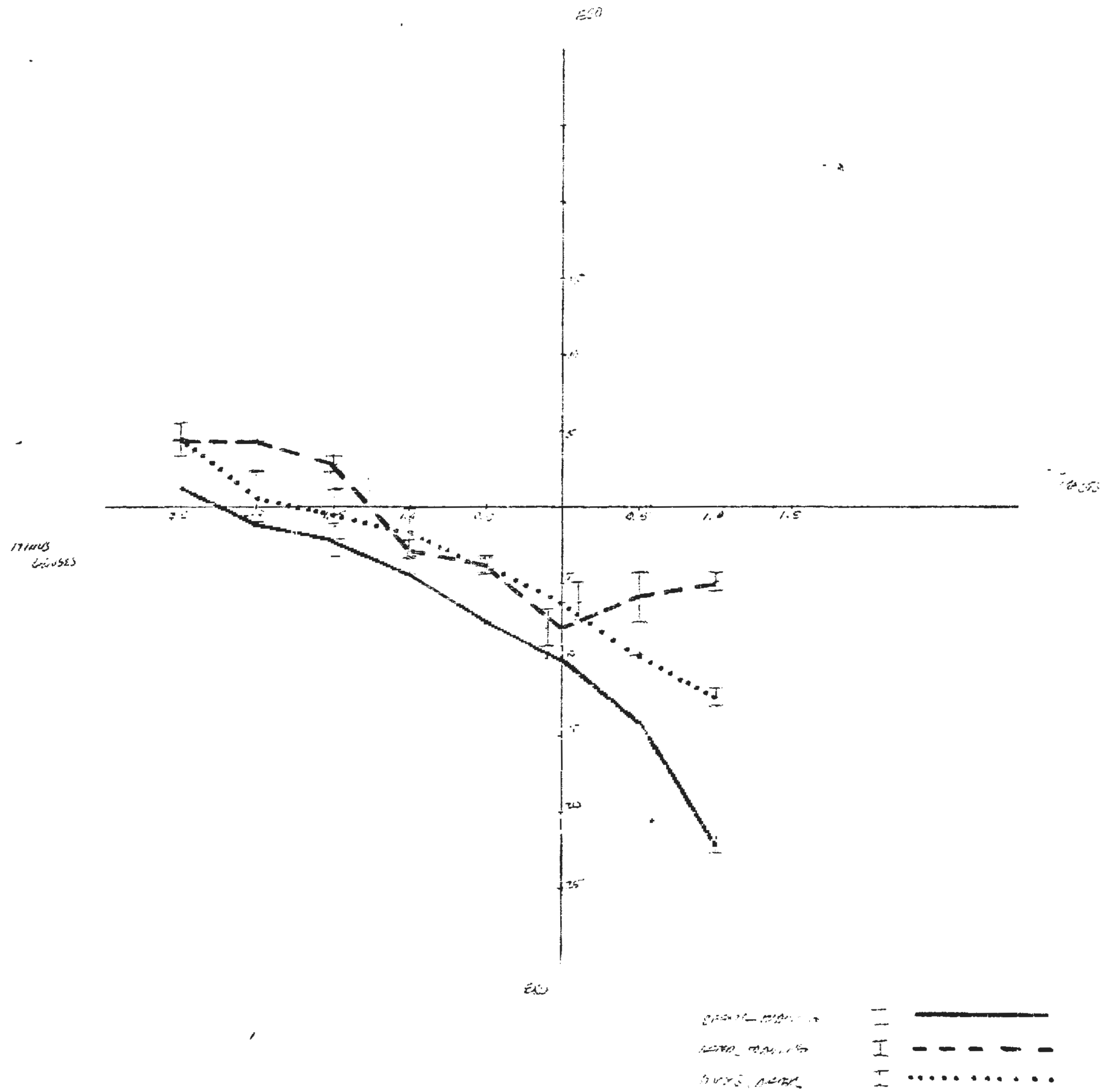
NO. 9



NO. 9

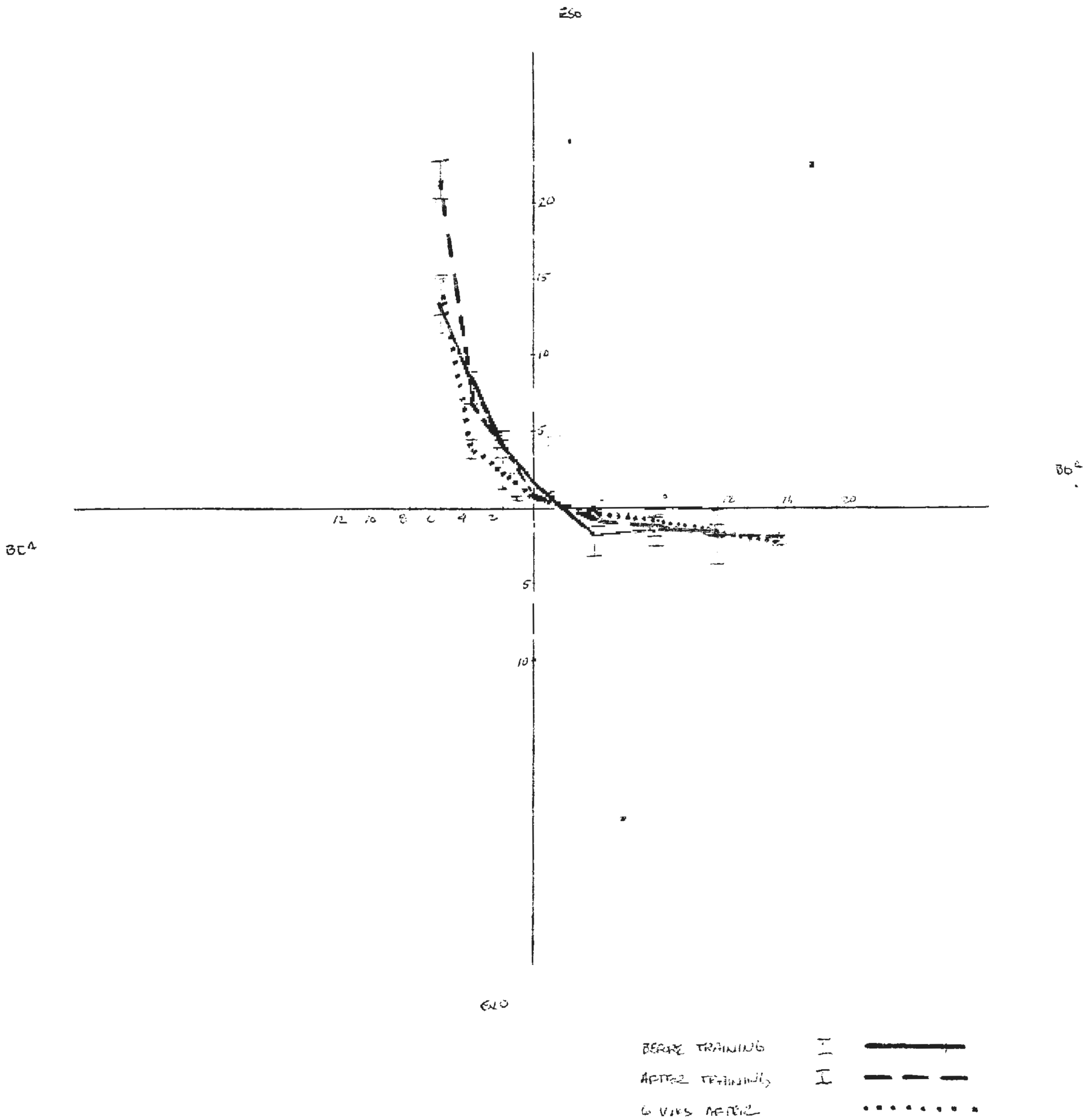

ESO
BE^Δ
BO^Δ
20
15
10
5
2
8
12
20
BEFORE TRAINING
AFTER TRAINING
6 WKS AFTER

NO. 9



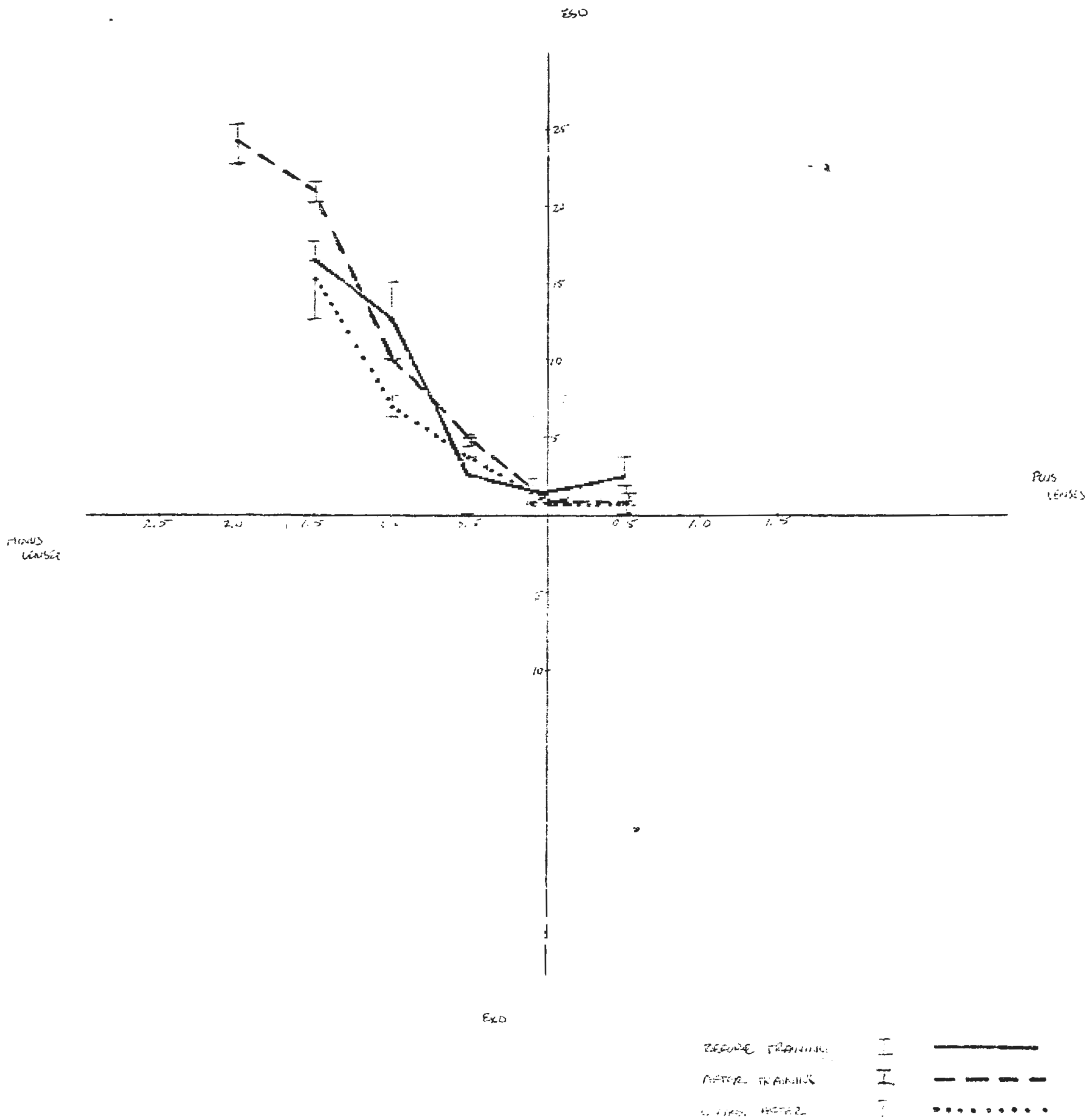
E.C.
PRISM @ 4.25 M

NO. 10



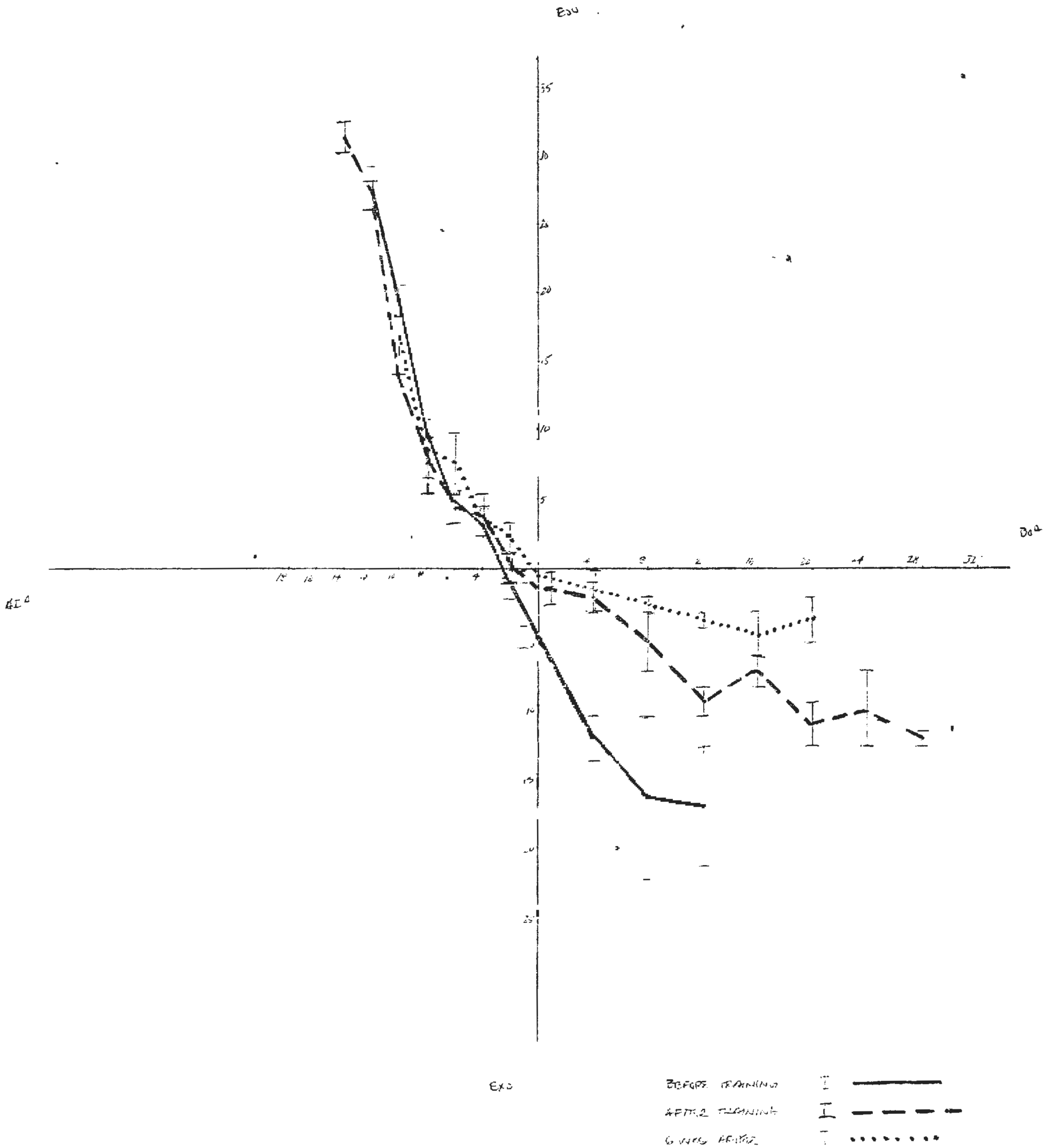
E.C.
LENSES @ 4.25M

NO. 10



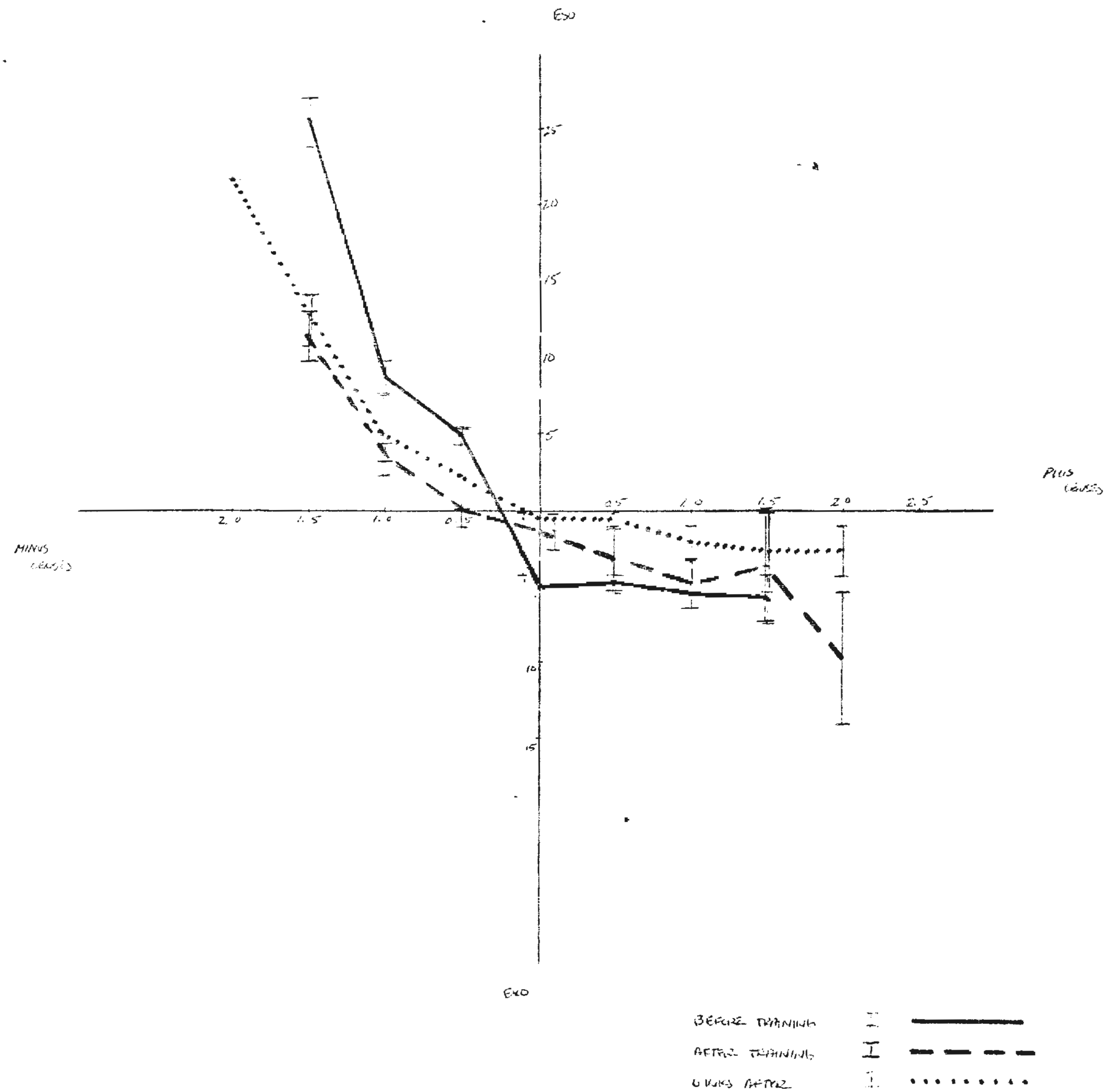
E.C.
PRISM @ 40CM

NO. 10



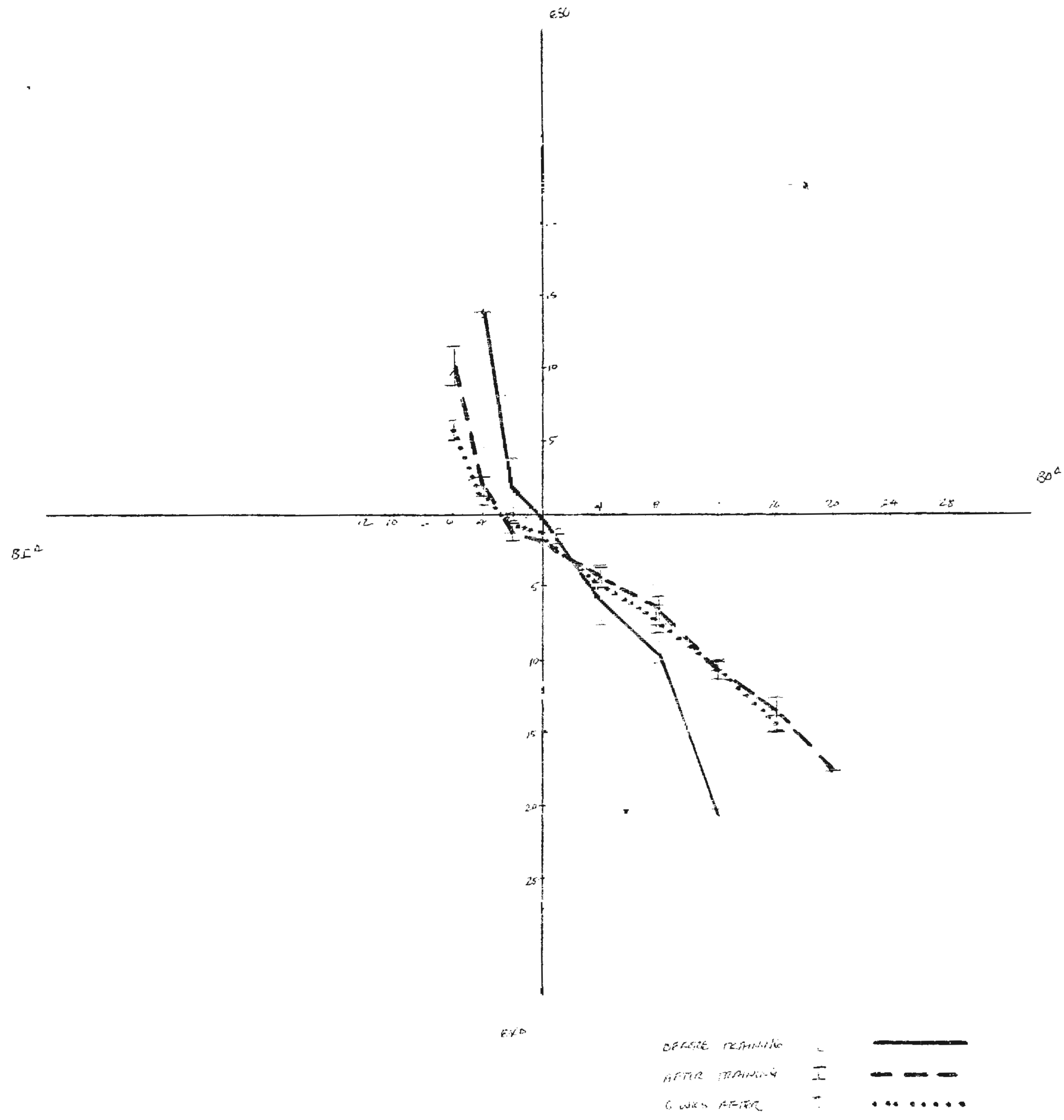
E.C.
LENSES @ 40 CM

NO. 10



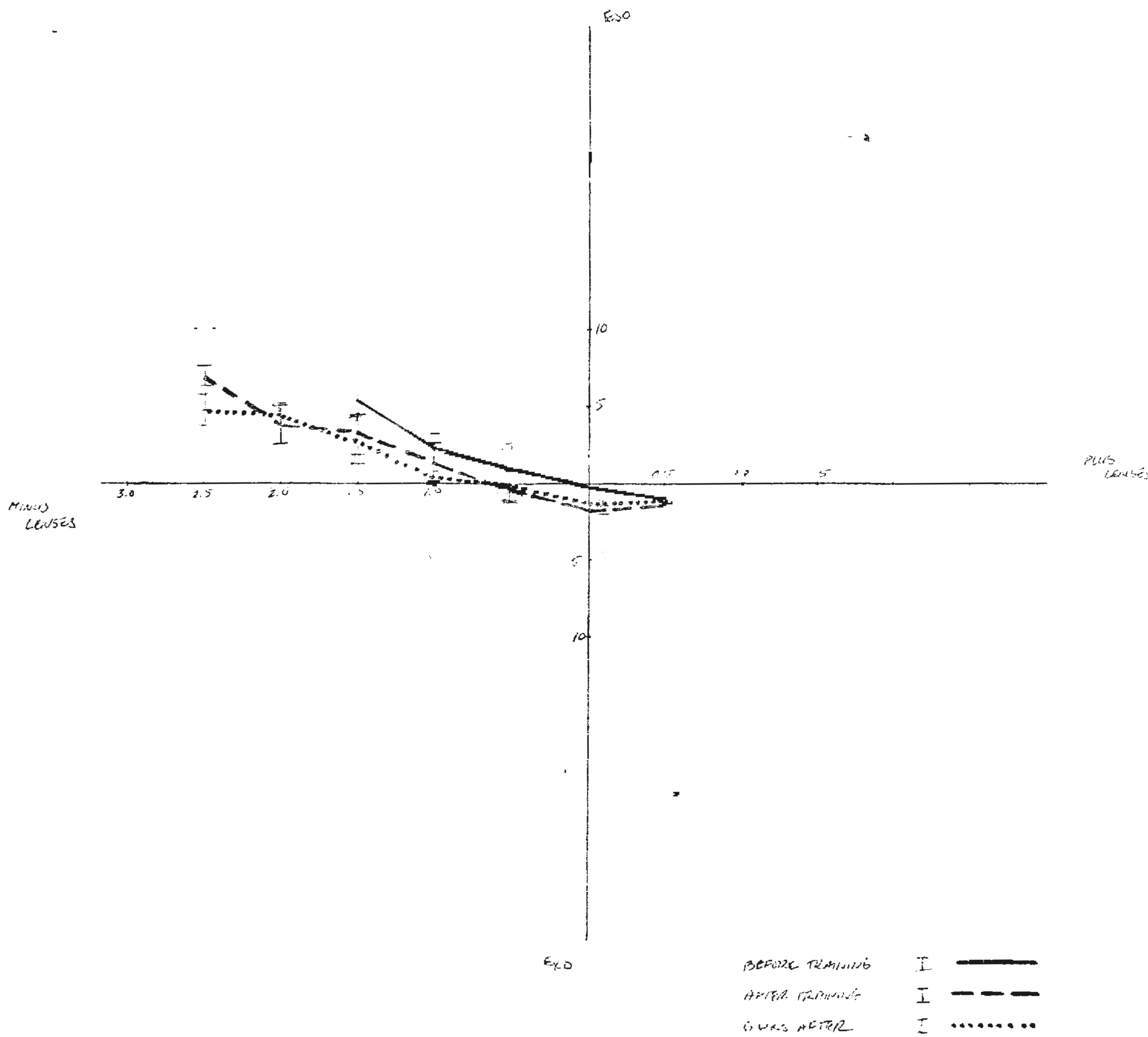
TOM KEENE
FRISNY'D 4.5 M

NO. 11



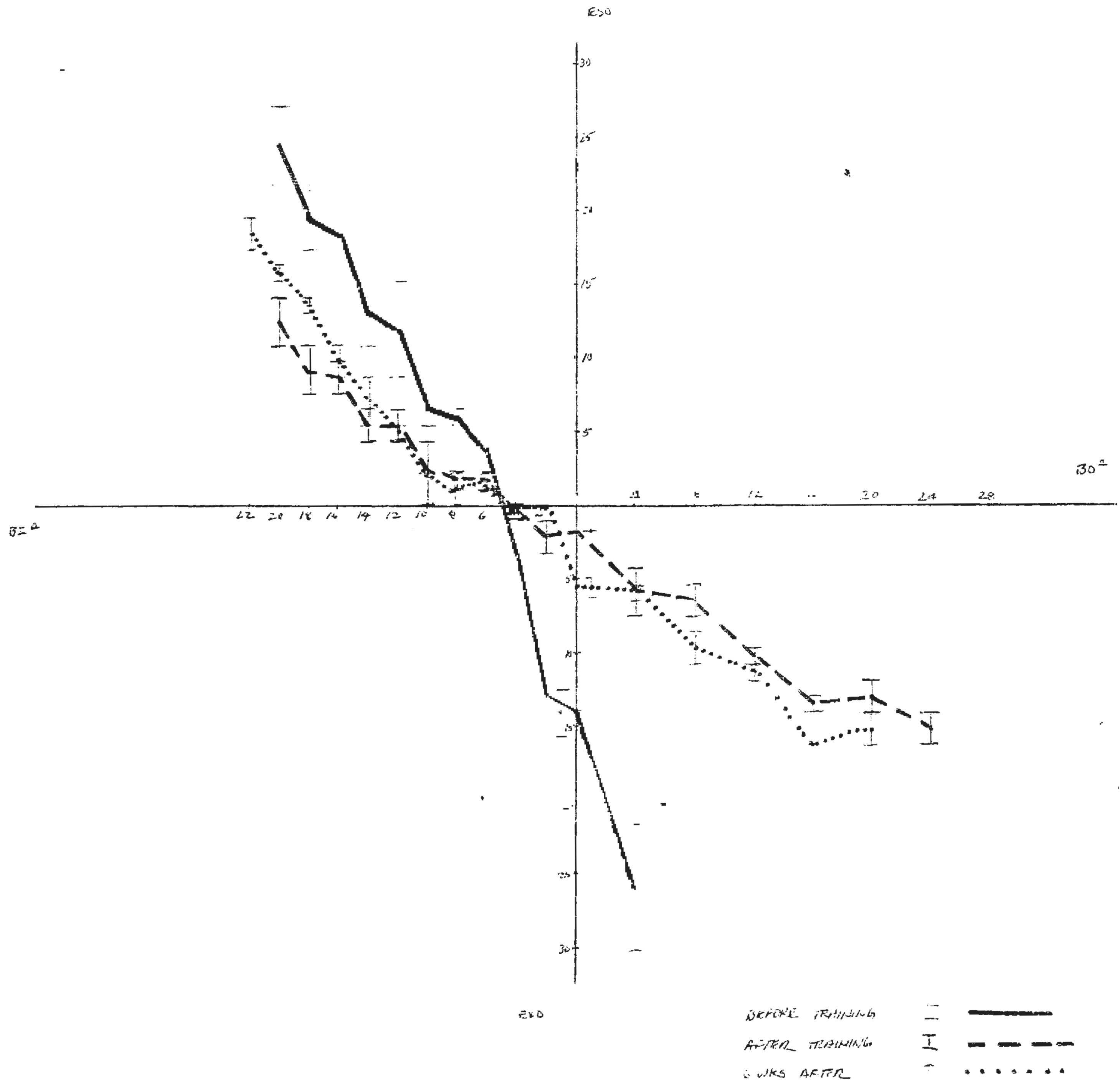
TOM KEENE
LENSES @ 4.5M

NO. 11



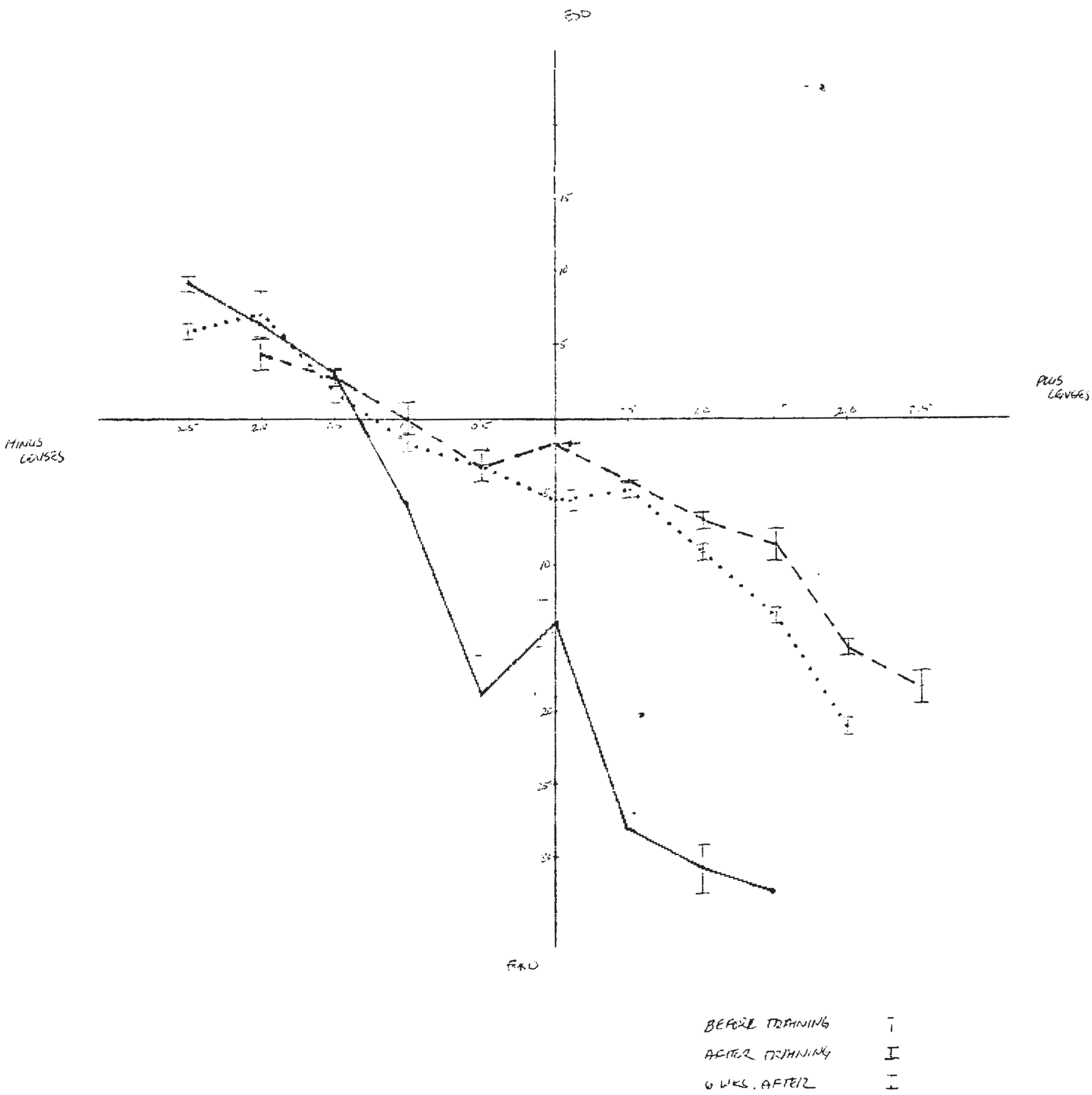
TOM KEENE.
PRISM @ 40CM

NO. 11



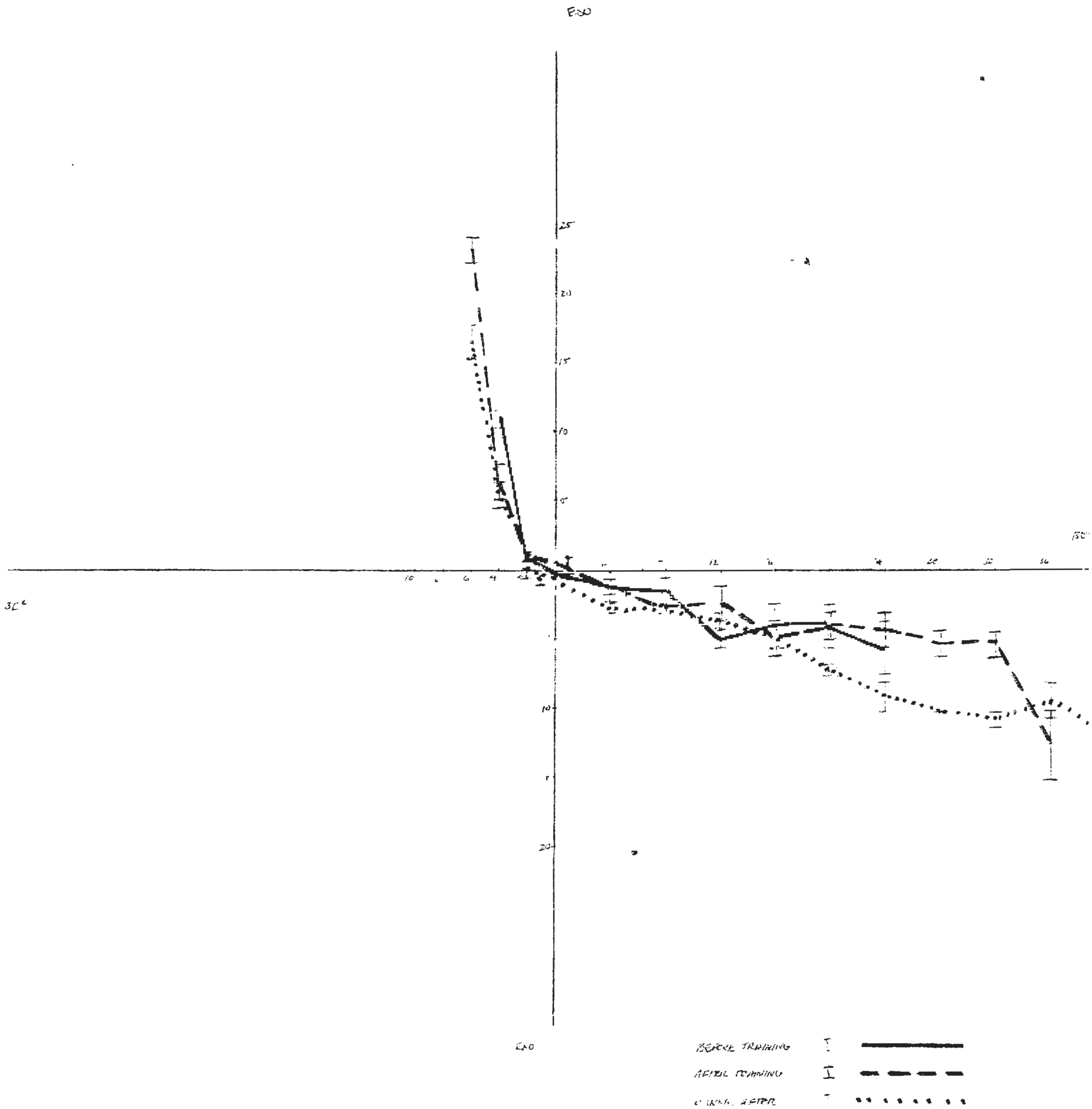
TOM KEENE
LENSES @ 40CM

NO. 11



B.L.
PRISM @ 4.5M

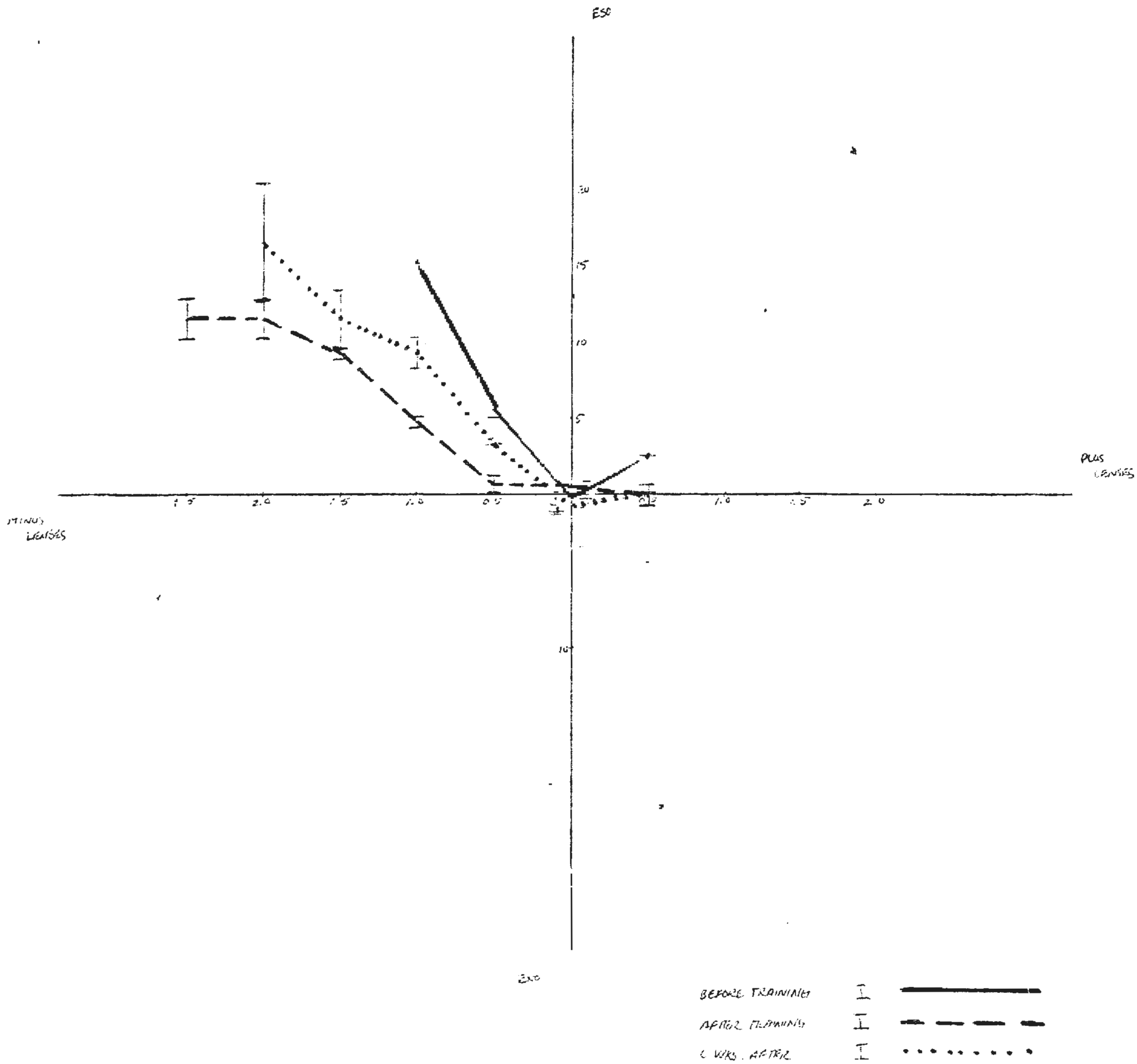
NO. 12



B.L.

LENSES @4.5M

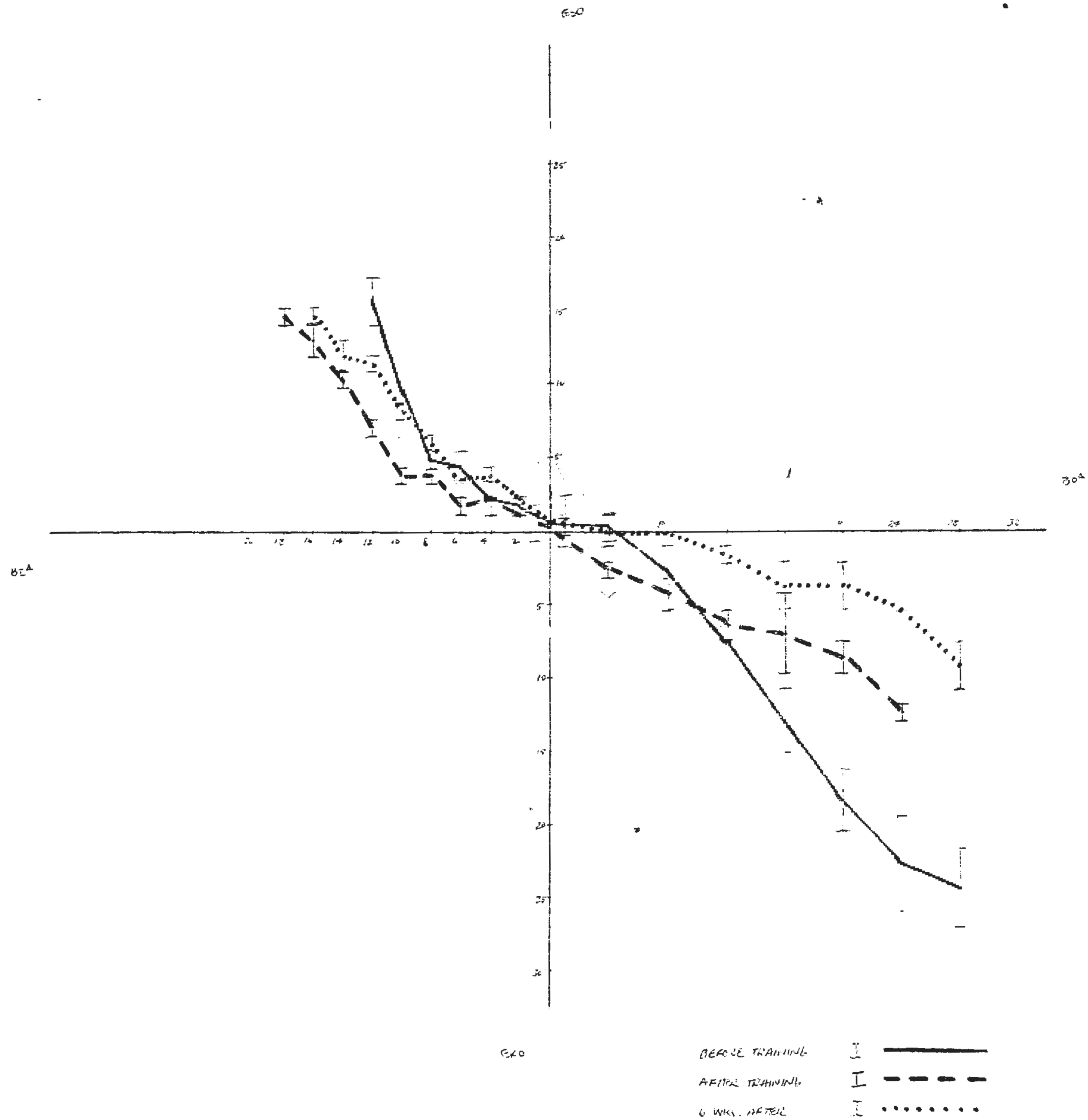
NO. 12



B.L.

PRISM @ 40 CM

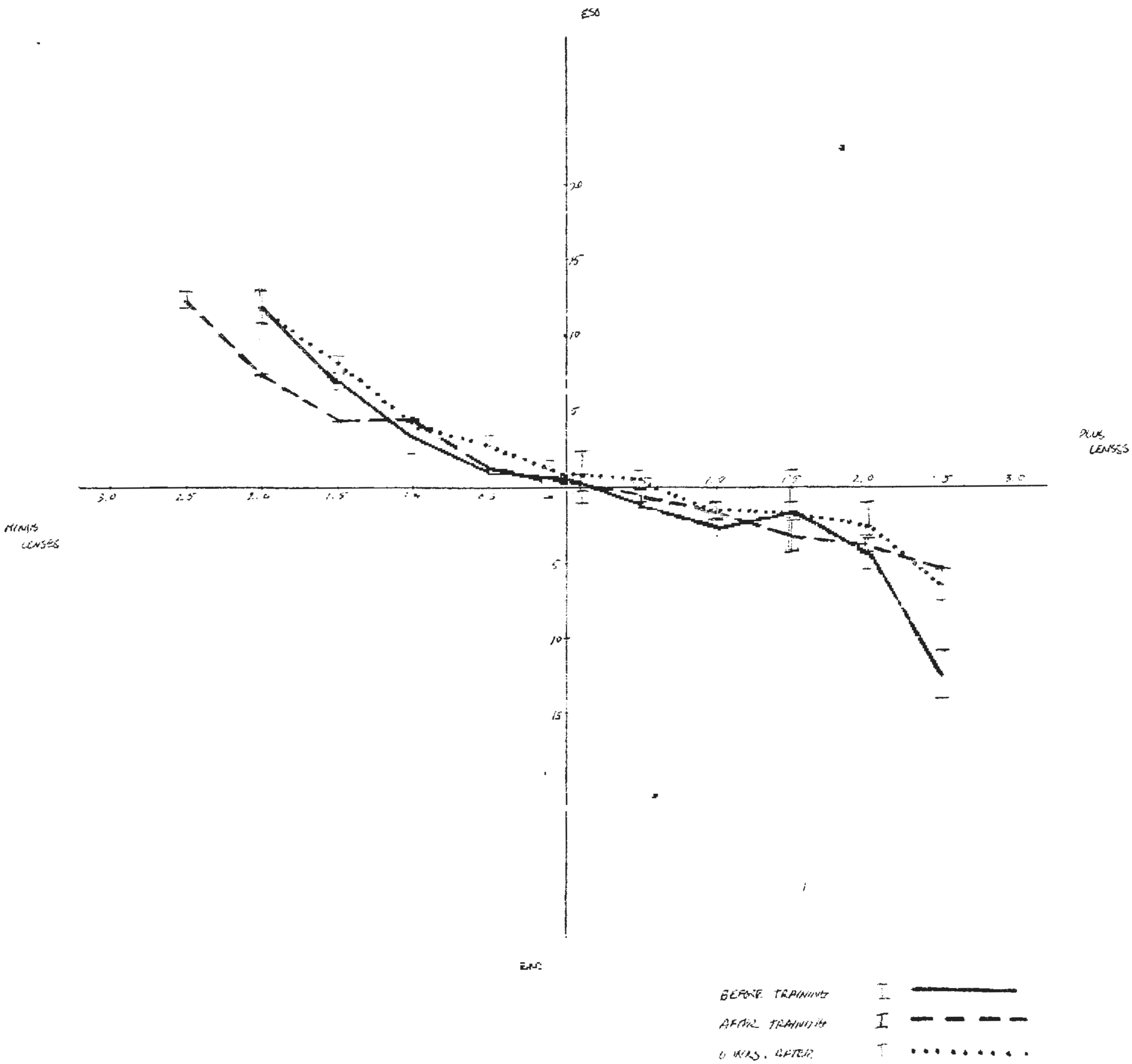
NO. 12



B. L.

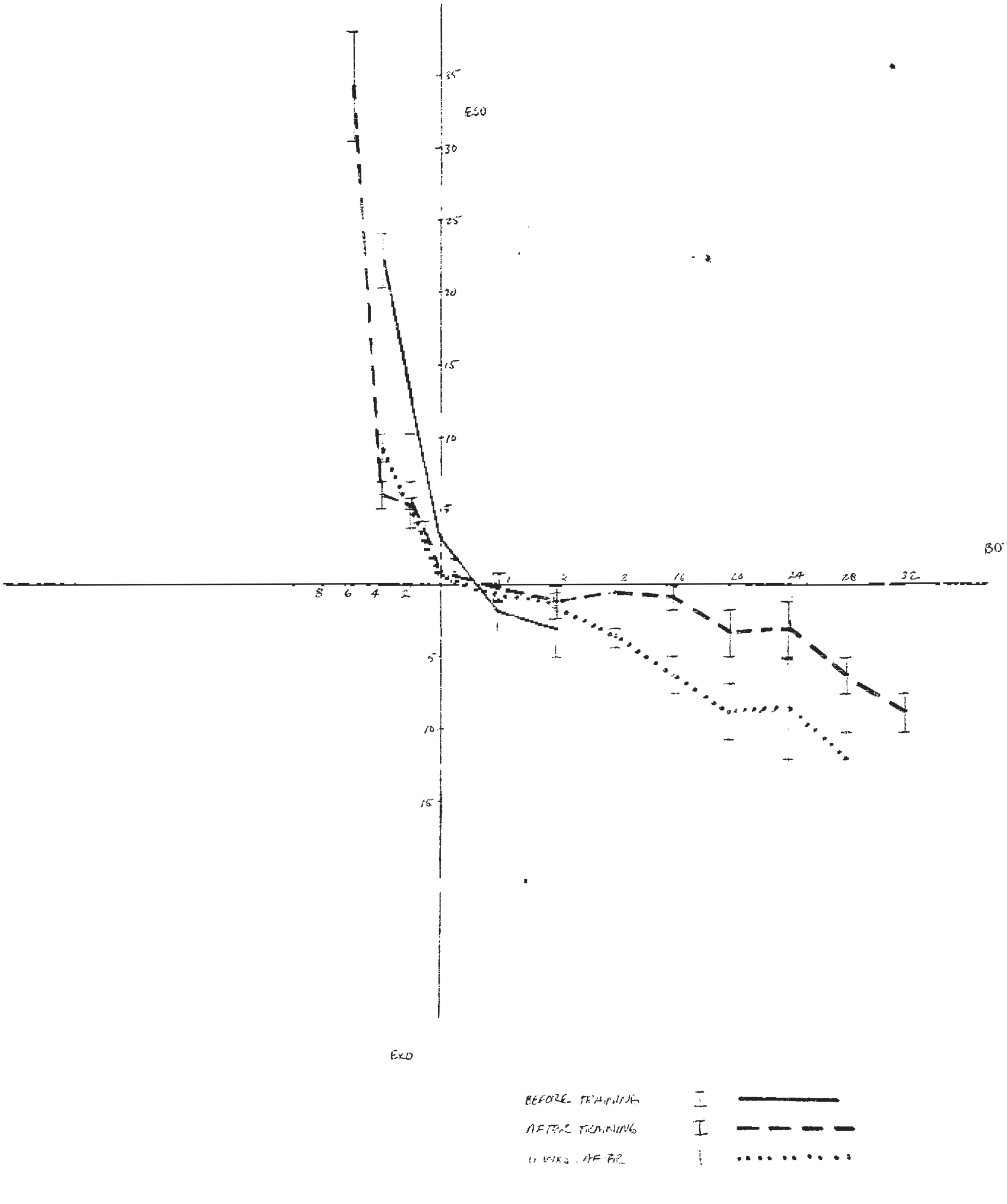
LENSES @ 40 CM

NO. 12



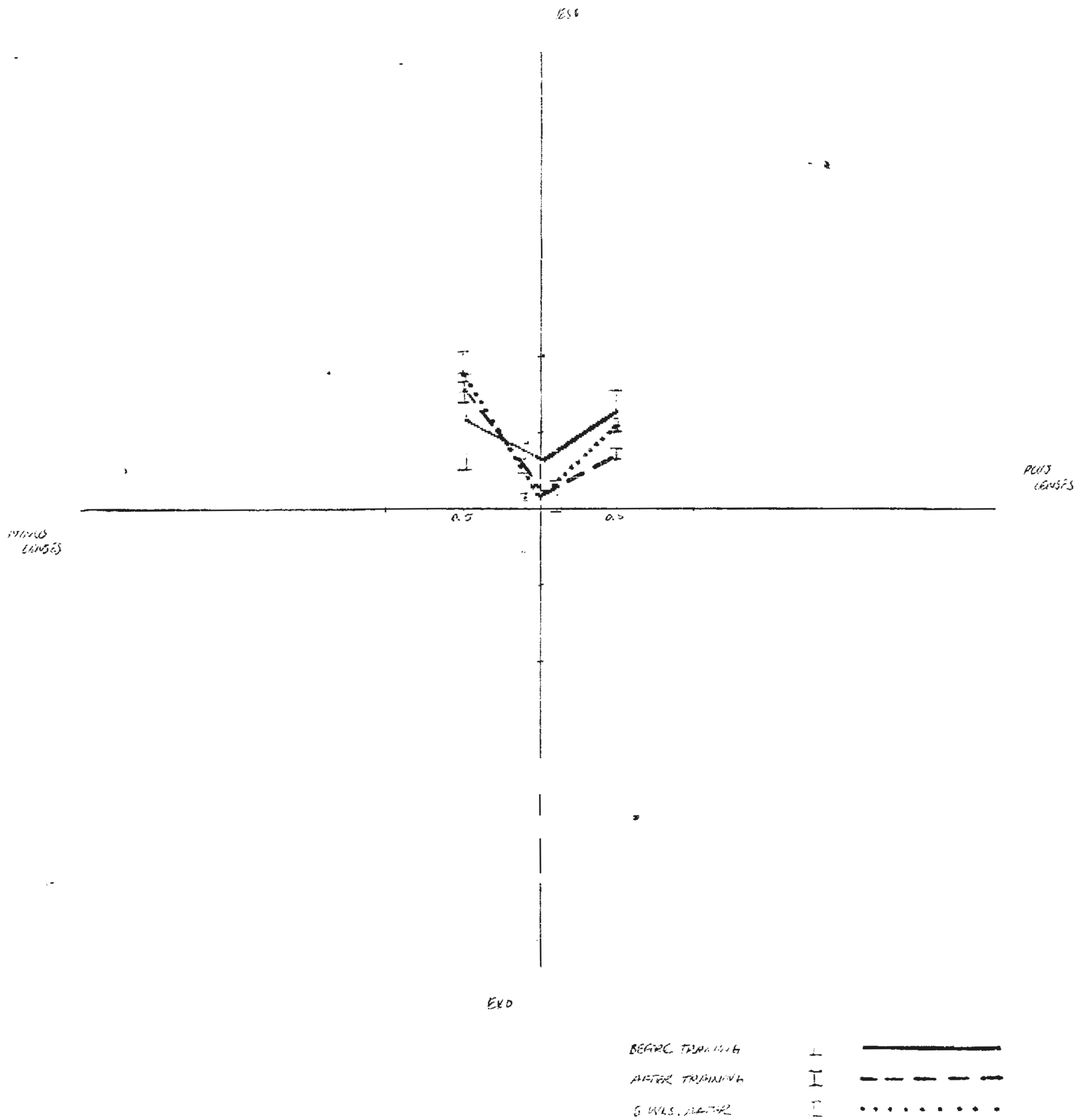
A.S.
PRISM @ 4.25M

NO. 13



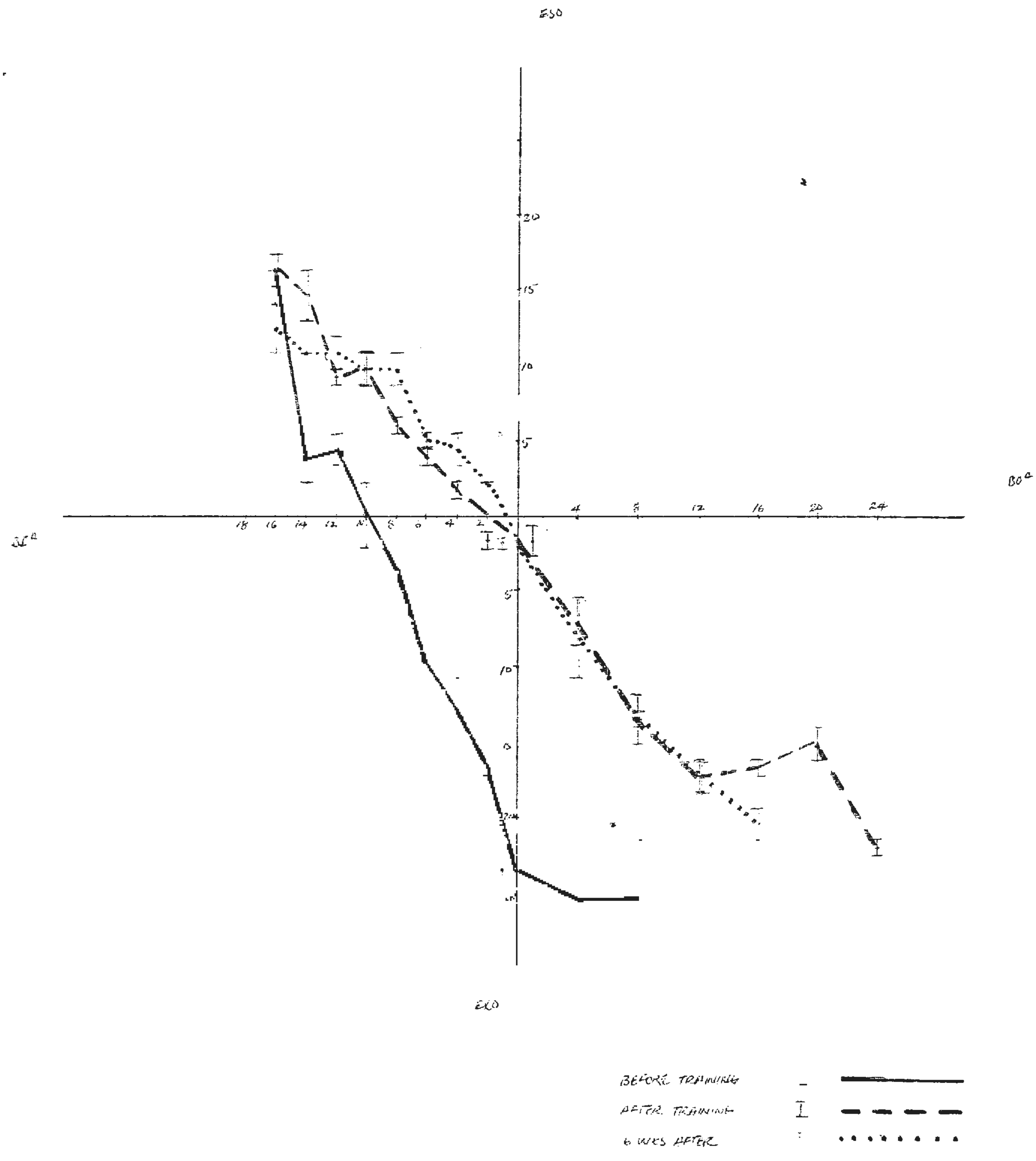
A.S.
LENSES @ 4.25M

NO. 13



A.S.
PRISM @ 40CM

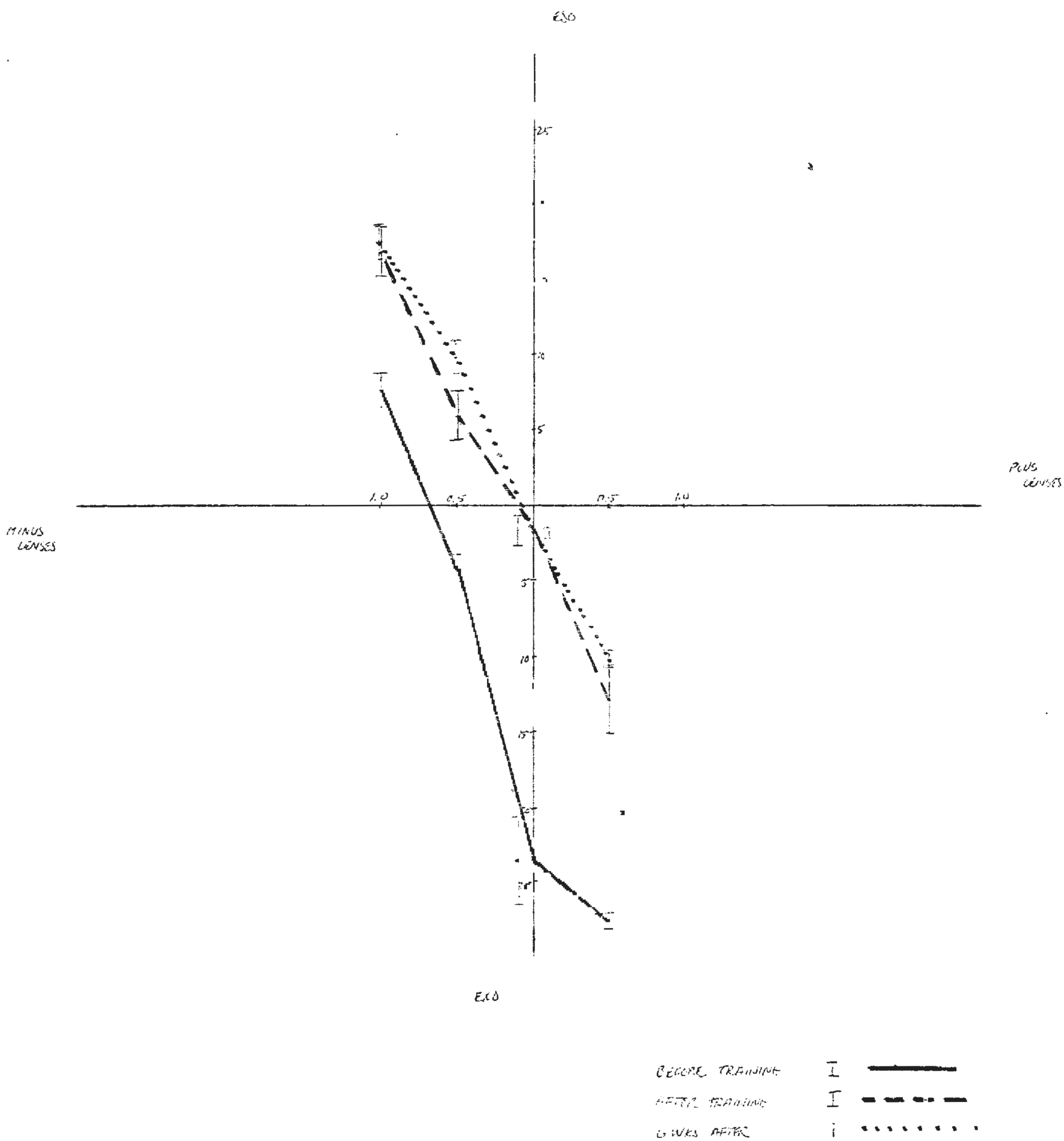
NO. 13



A.S.

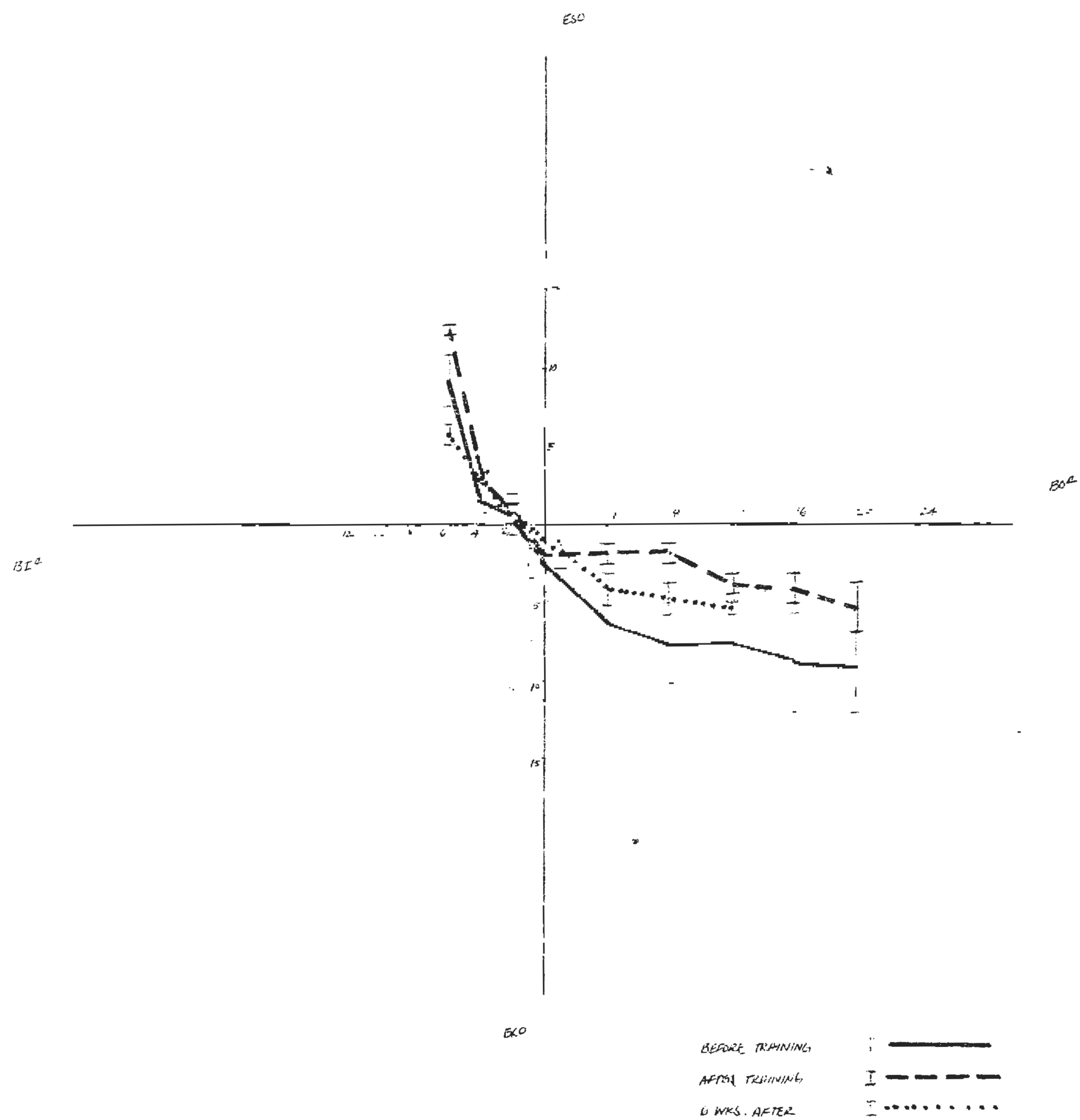
LENSES @ 40 CM

NO. 13



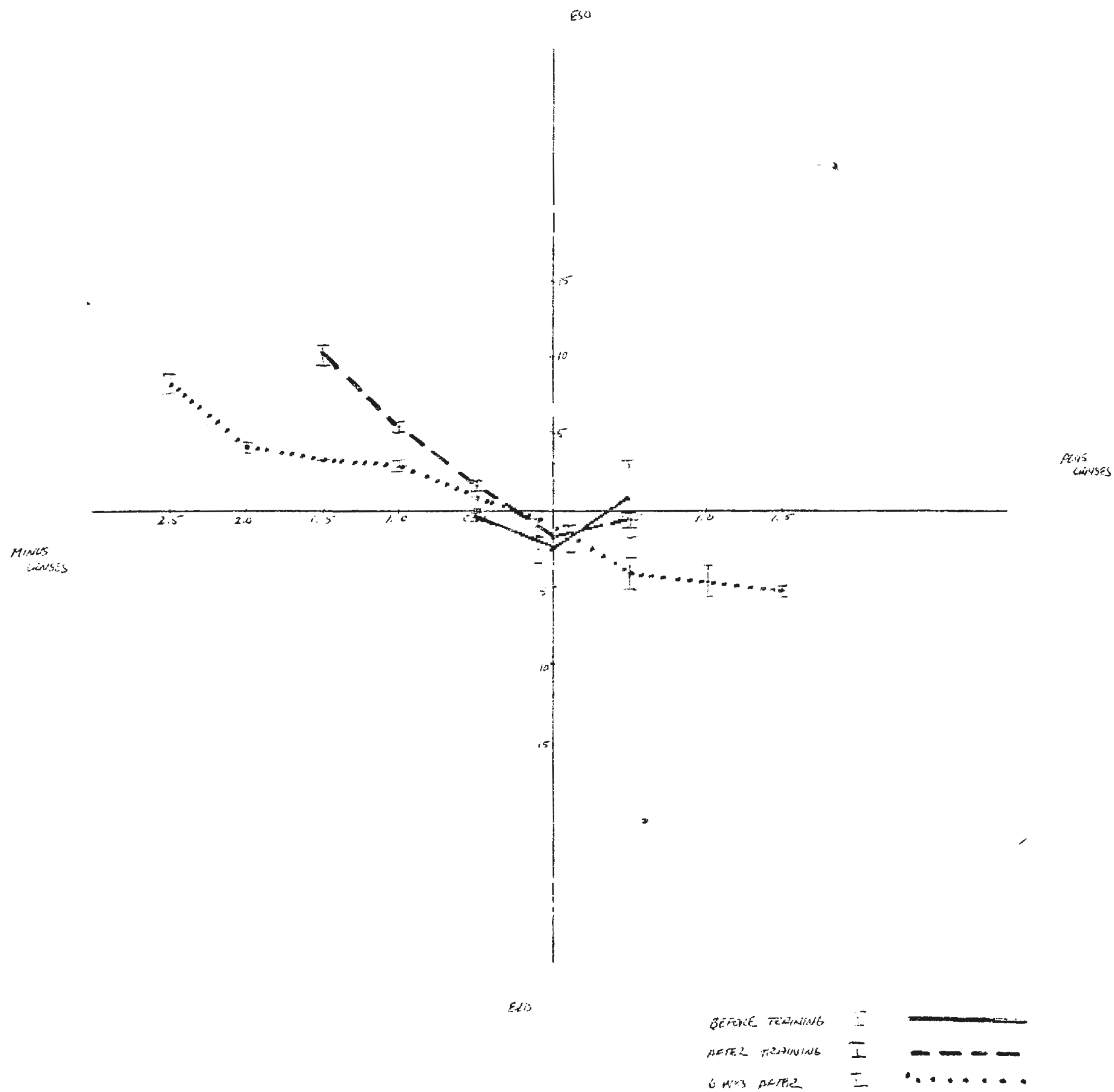
H.F.
PRISM @ 4.5 M

NO. 14



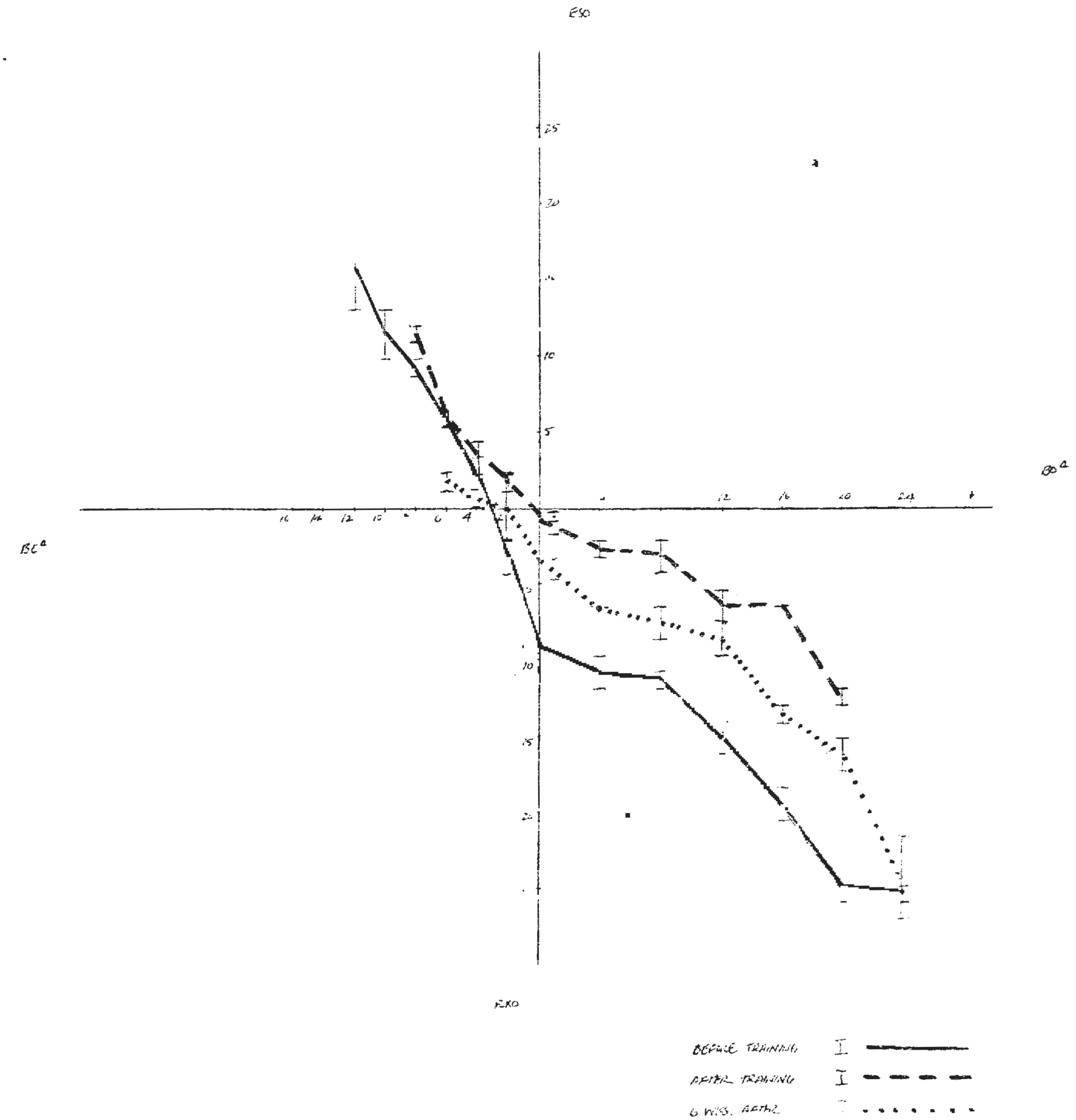
H. F.
LENSES @ 4.5 M

NO. 14



H.F.
PRISM @ 40CM

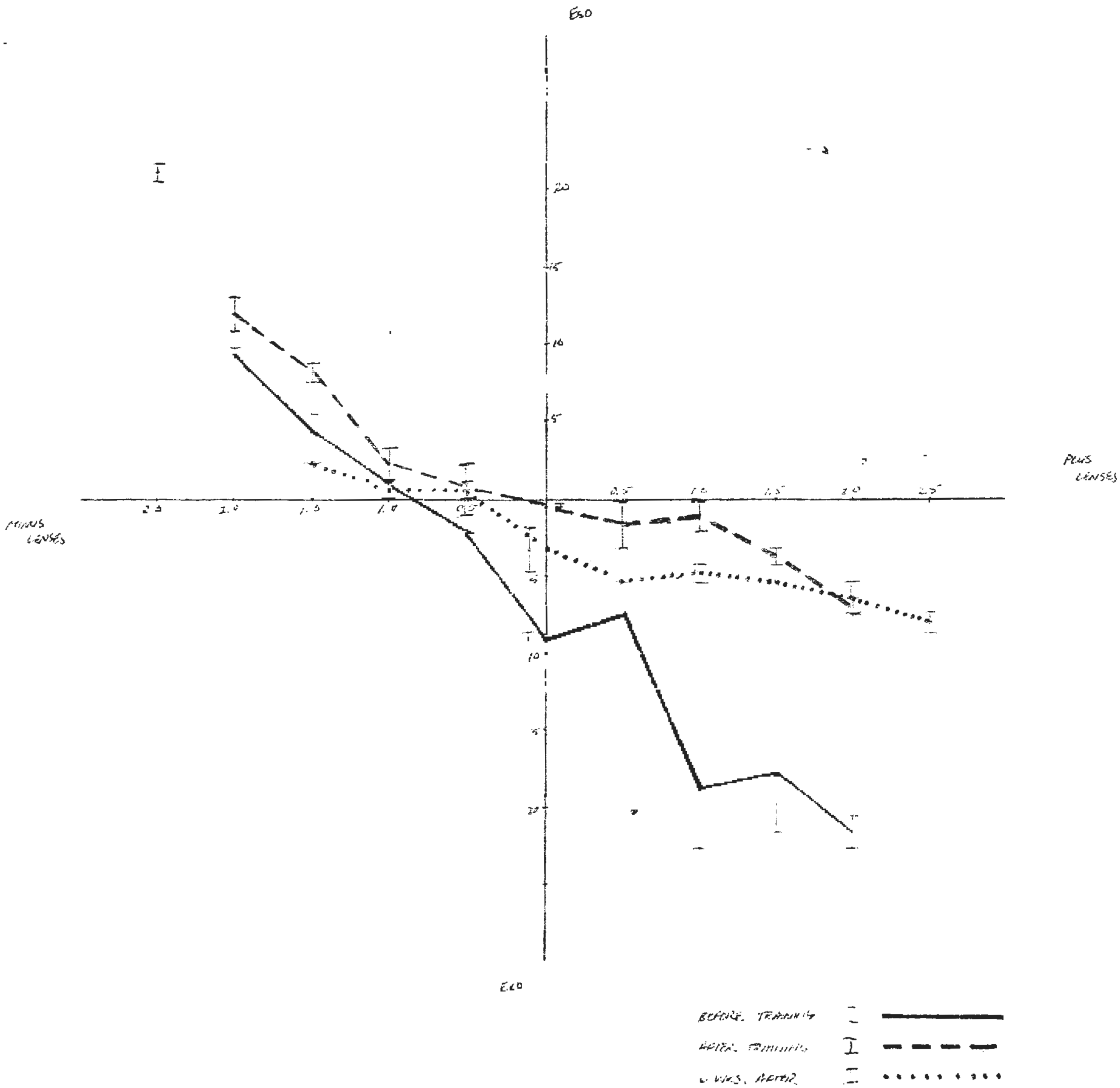
NO. 1A



H. F.

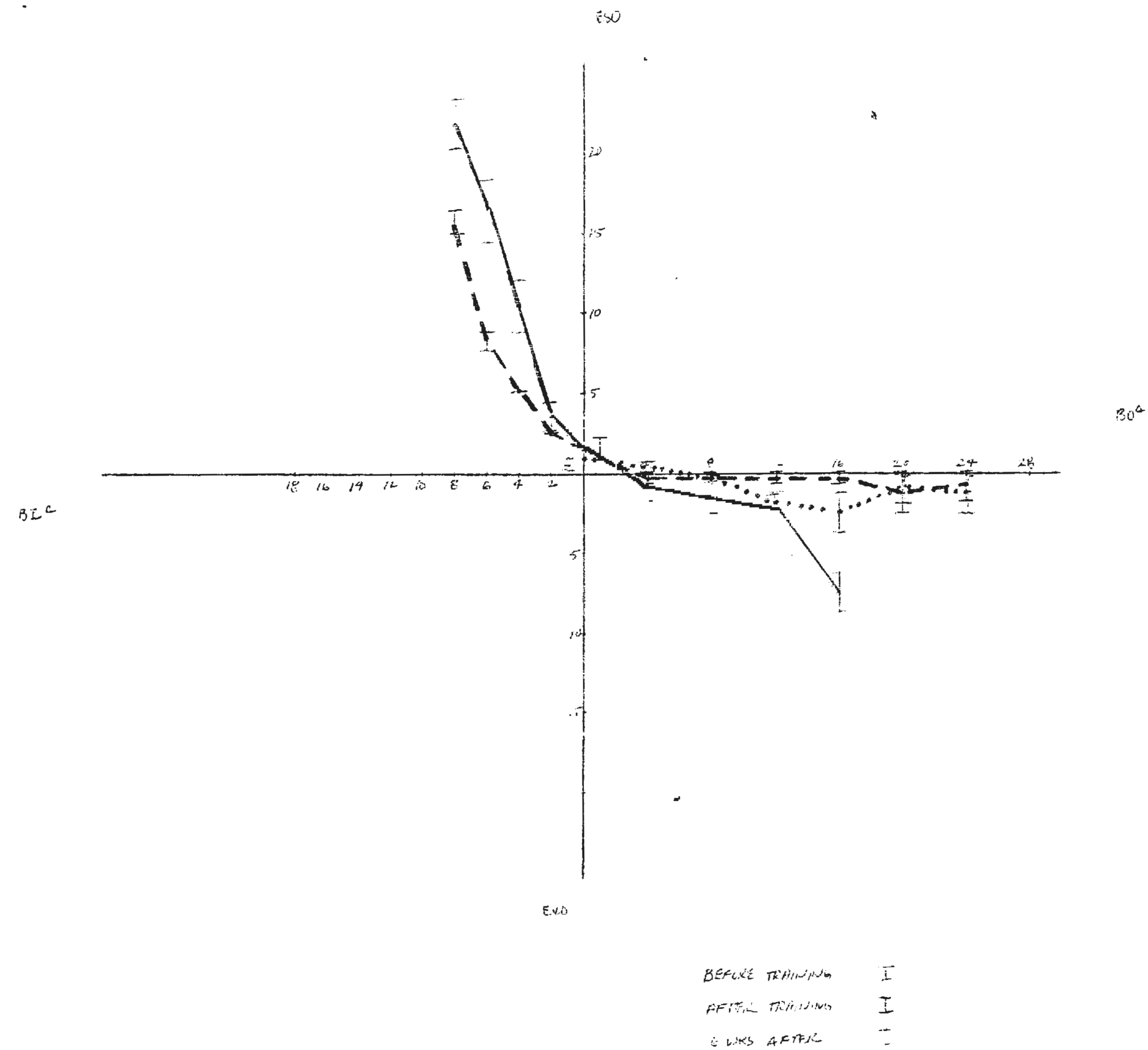
LENSES @ 40 CM

NO. 1A



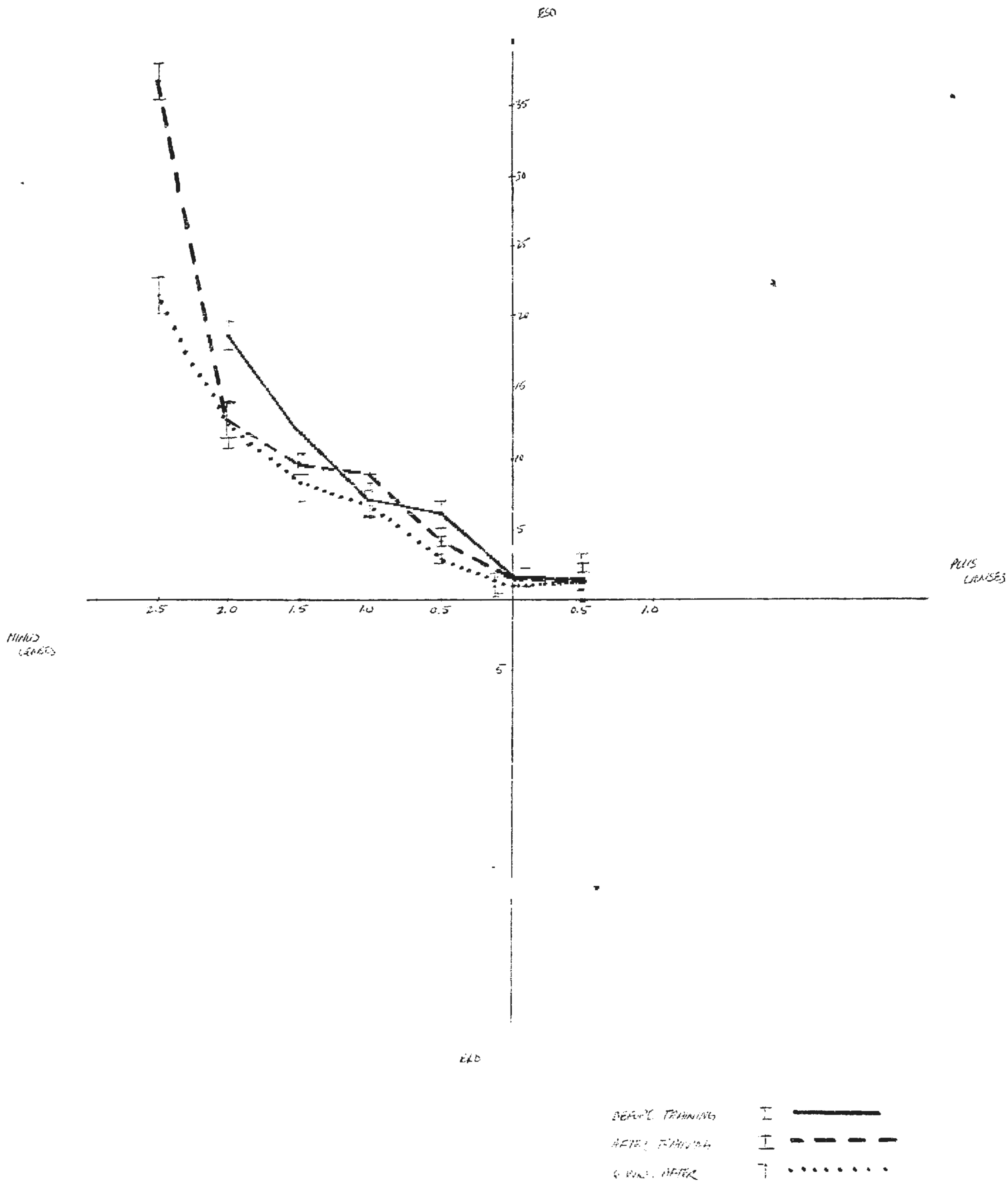
JOE MILLER
PRISM c 4.5M

NO. 15



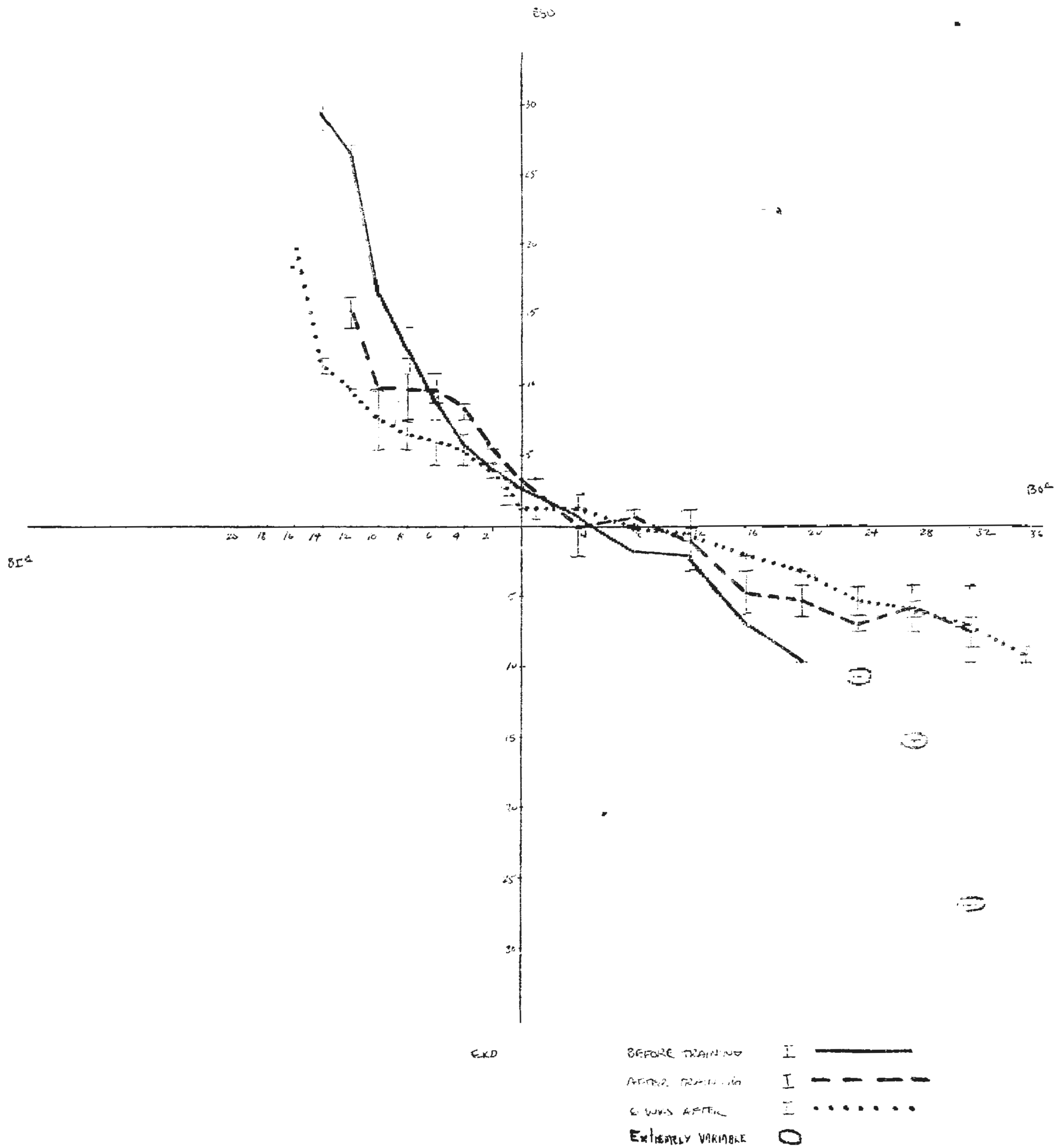
J.M.
LENSES IN 4.25M

NO. 15



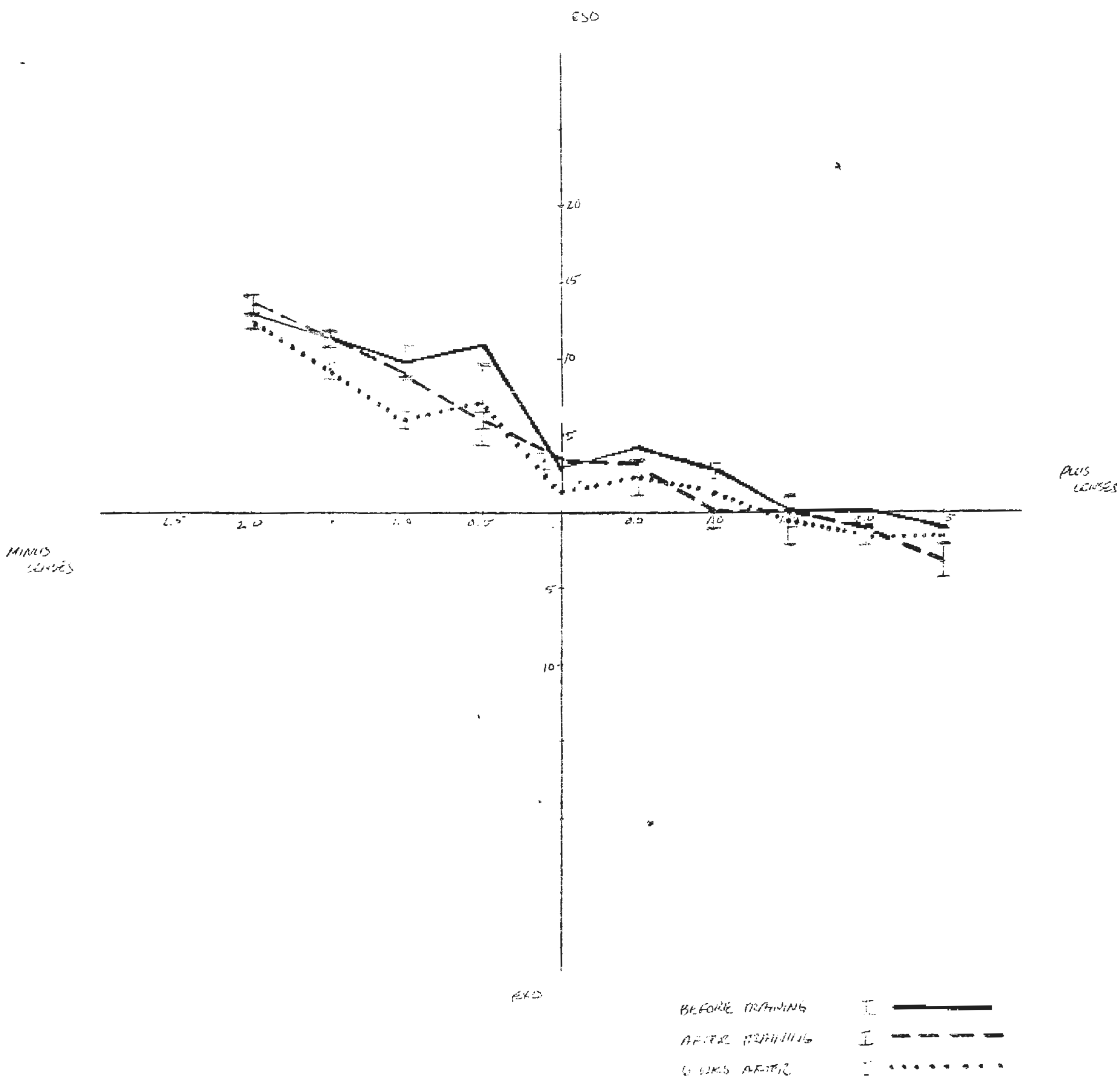
JOE MILLER
PRISM @ 40 CM

NO. 15



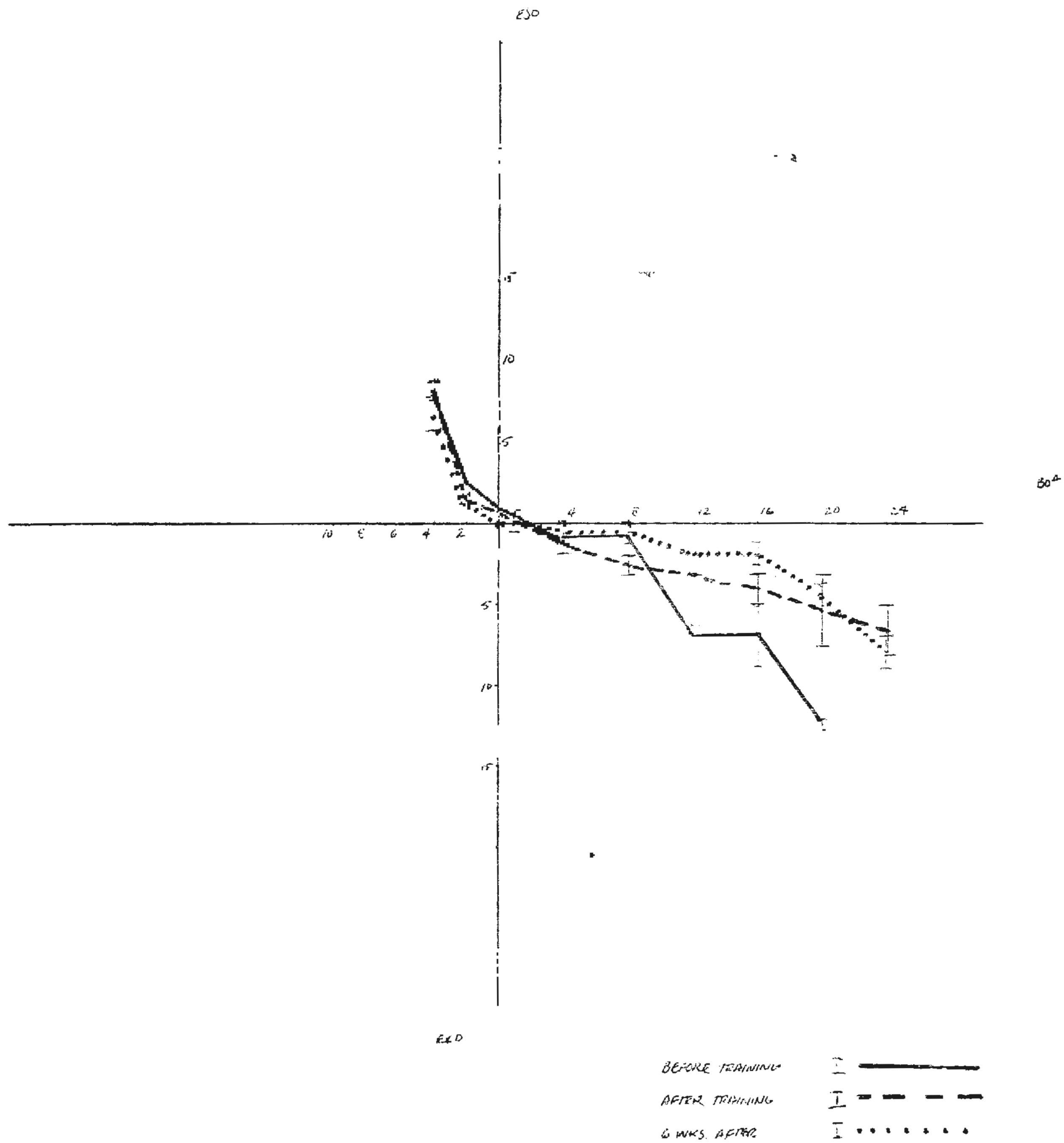
JOE MILLER
LENSES @ 40 CM

NO. 15



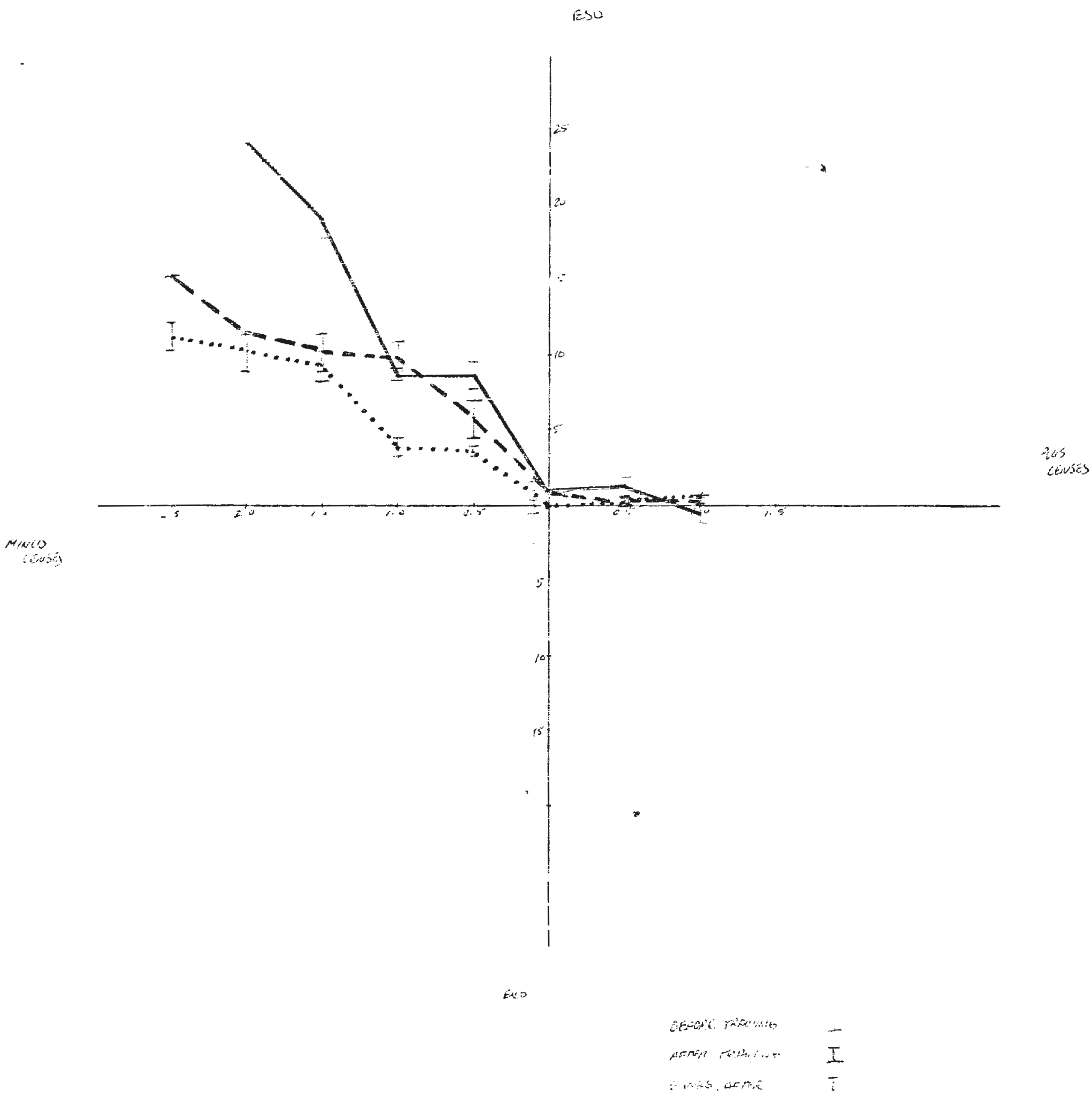
M. W.
PRISM (a) 45 M

NO. 16



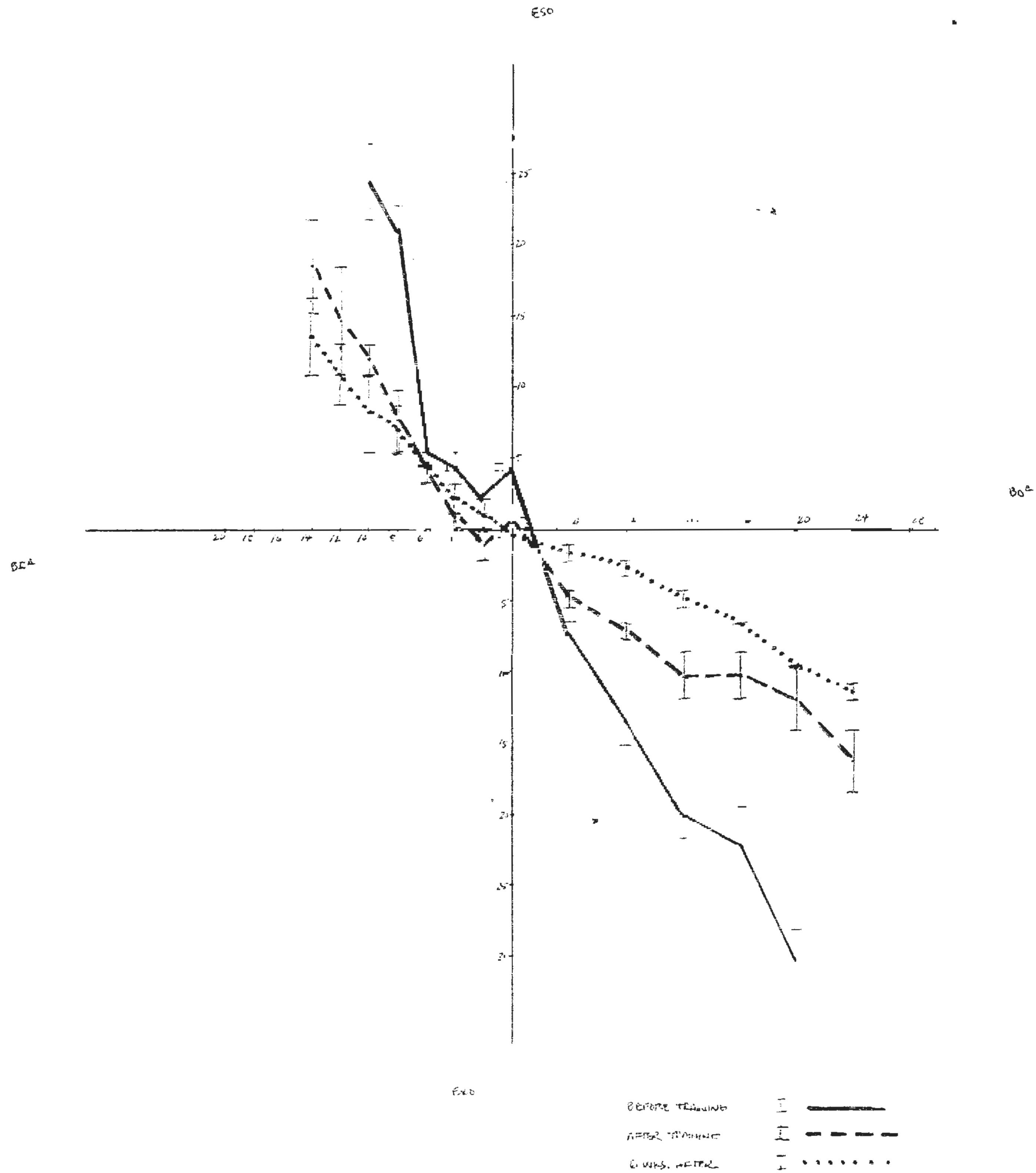
M.W.
LENSES @ 4.5 M

NO. 16



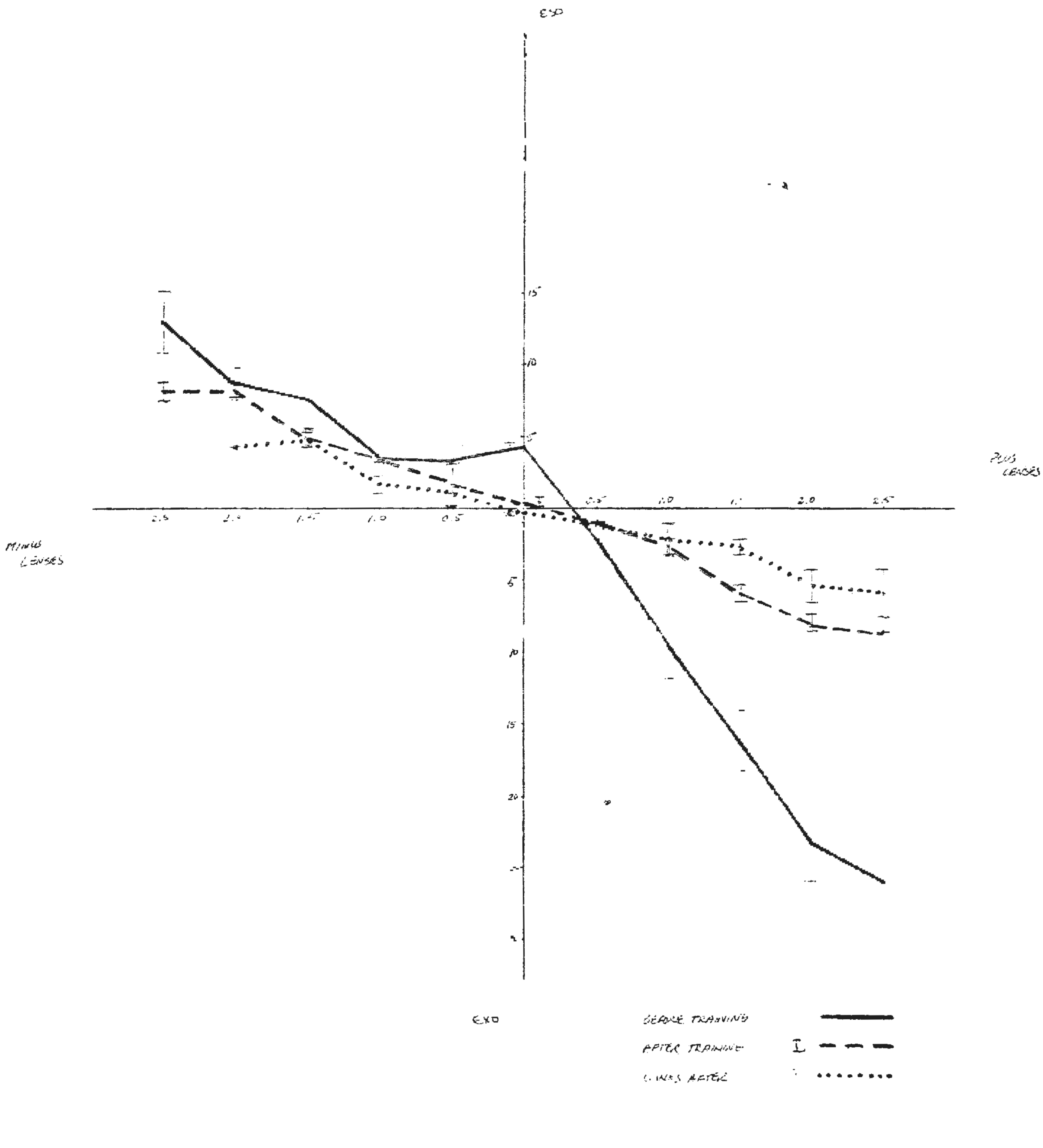
M.W.
PRISM @ 40CM

NO. 16



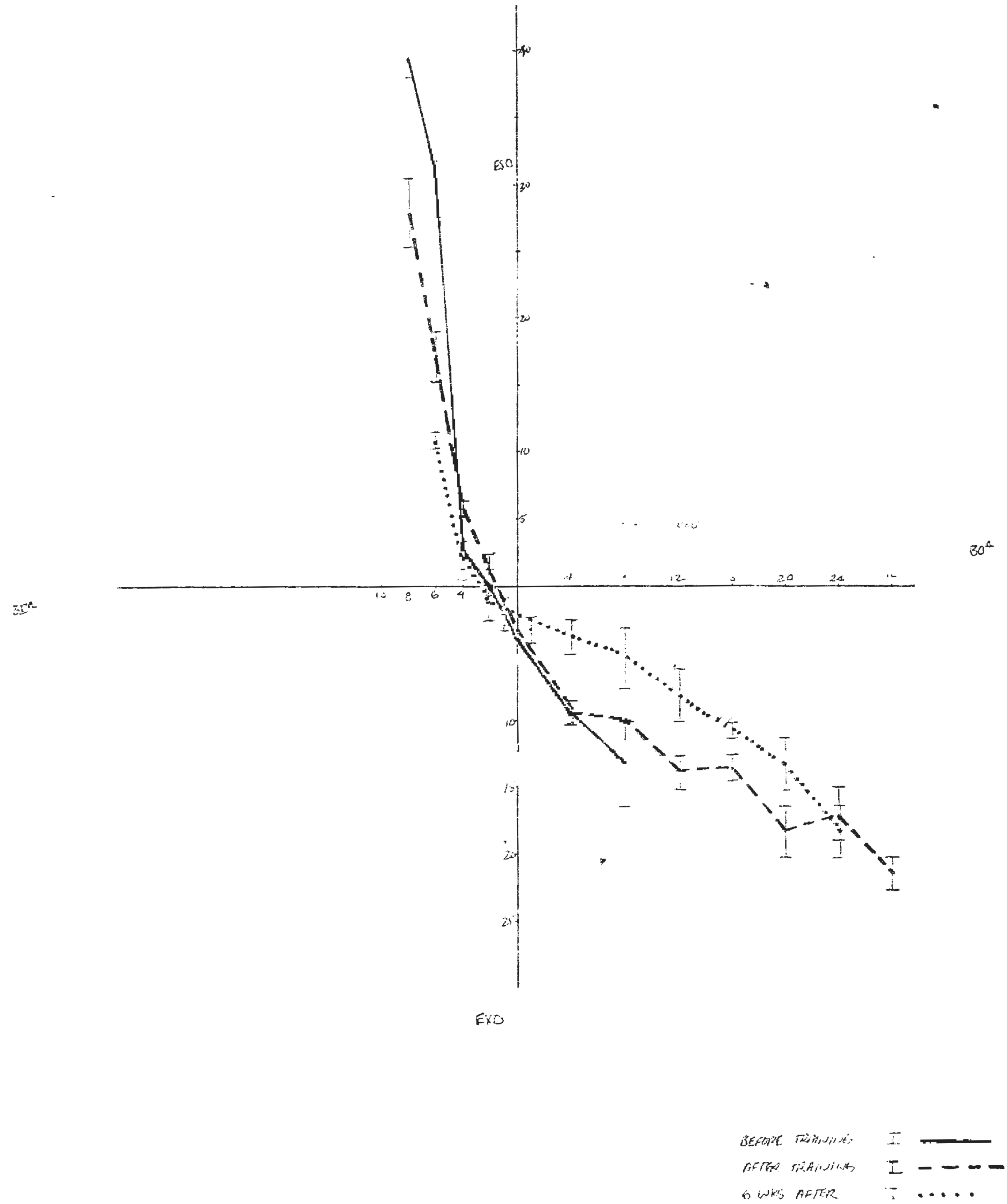
M.W.
LENSES @ 40CM

NO. 1b



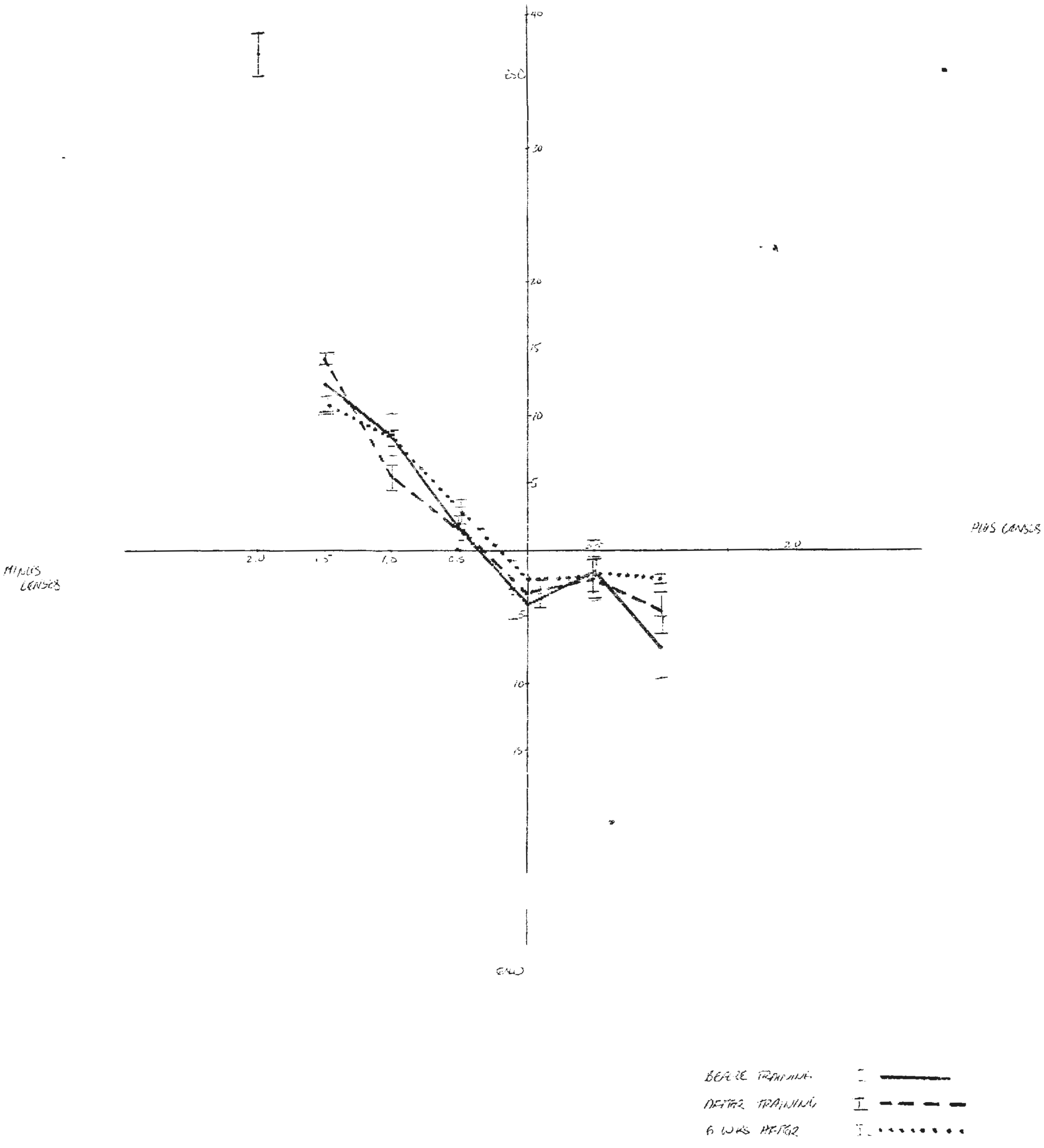
JEFF LIND
PRISM @ 45 M

NO. 17



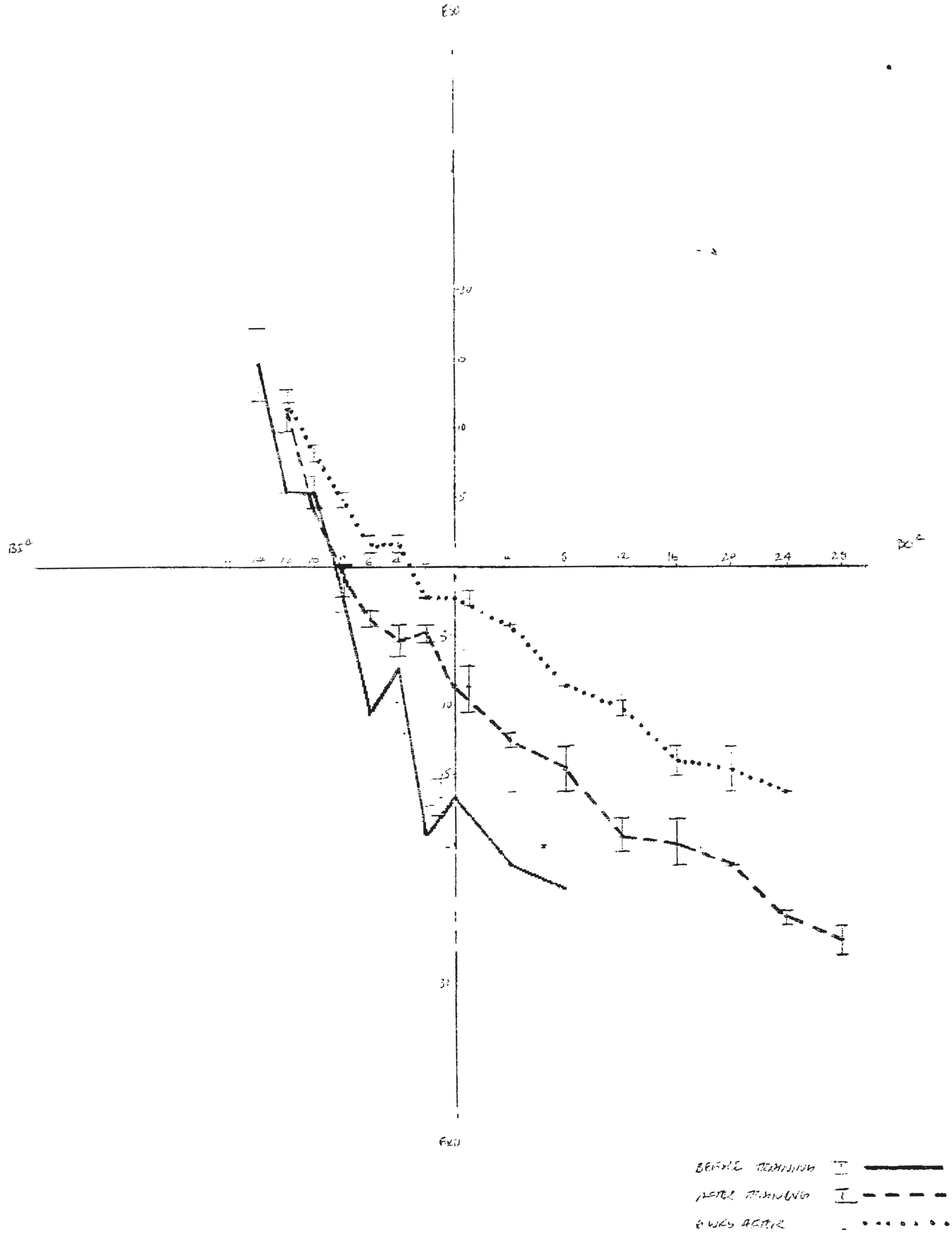
JEFF LIND
LENSES @45M

No. 11



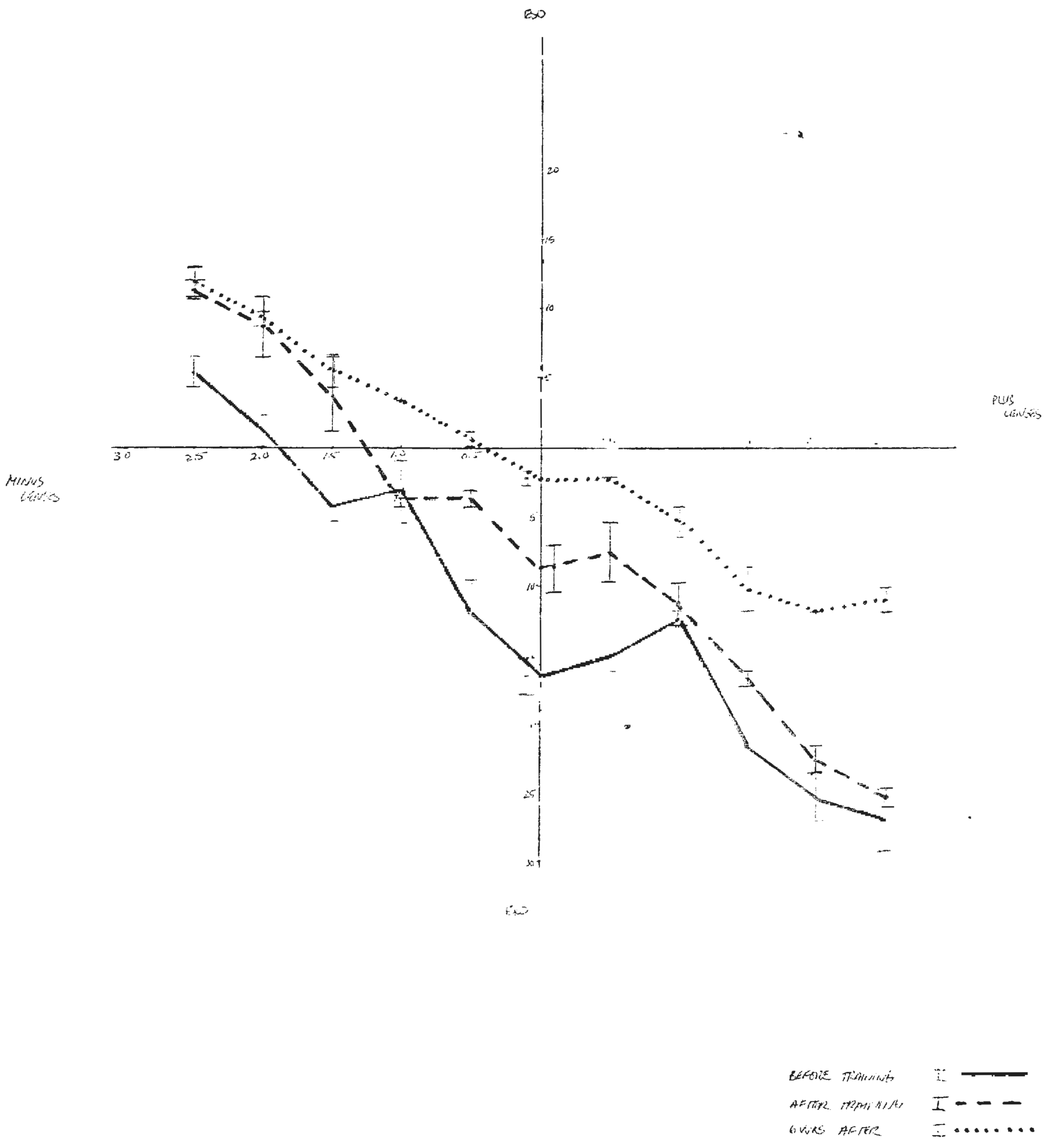
JEFF LIND
PRISM @40CM

NO. 17



JEFF LIND
LENSES @ 40cm

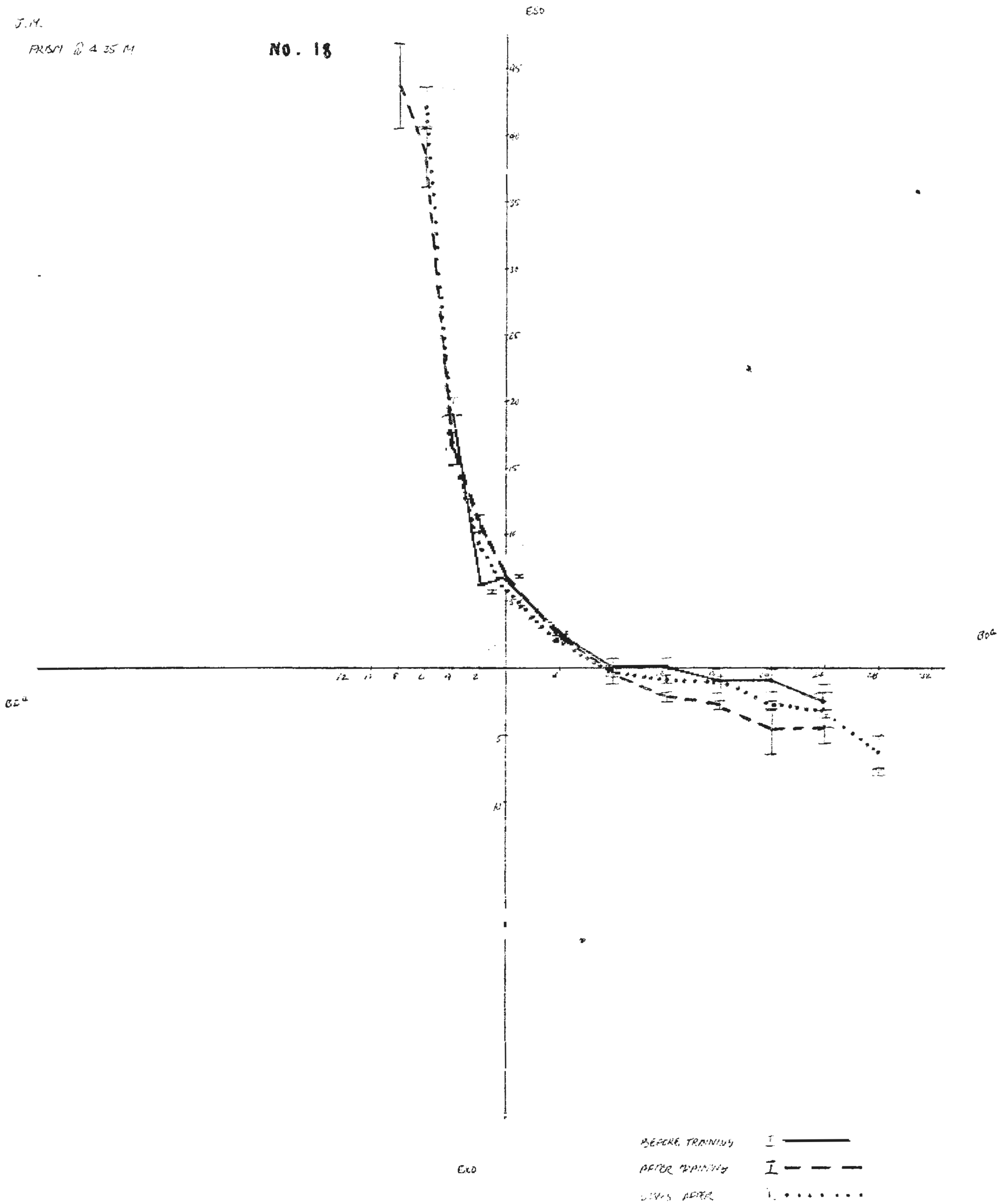
NO. 17



J.M.

PRISM @ 4 35 M

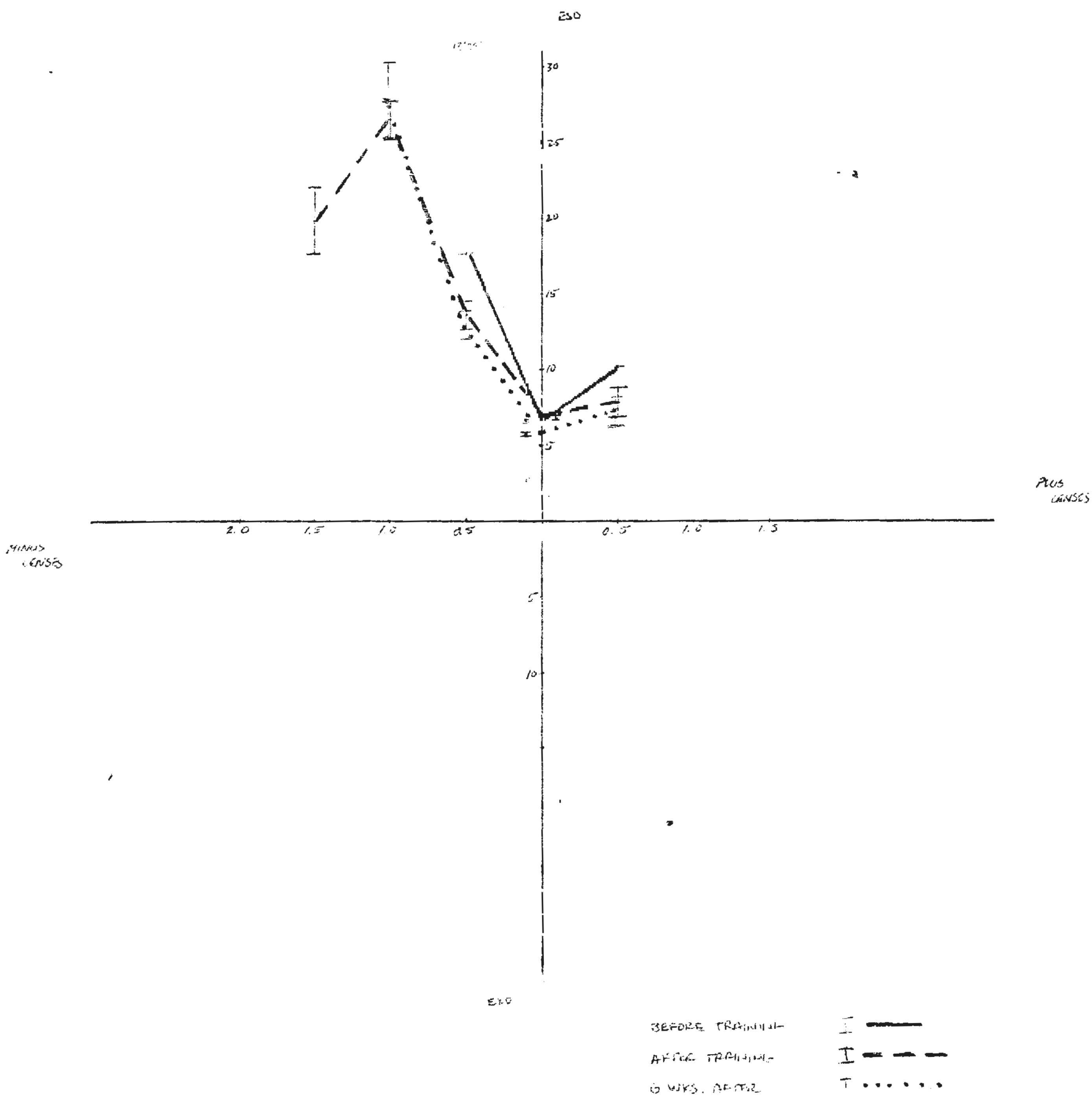
NO. 18



J.M.

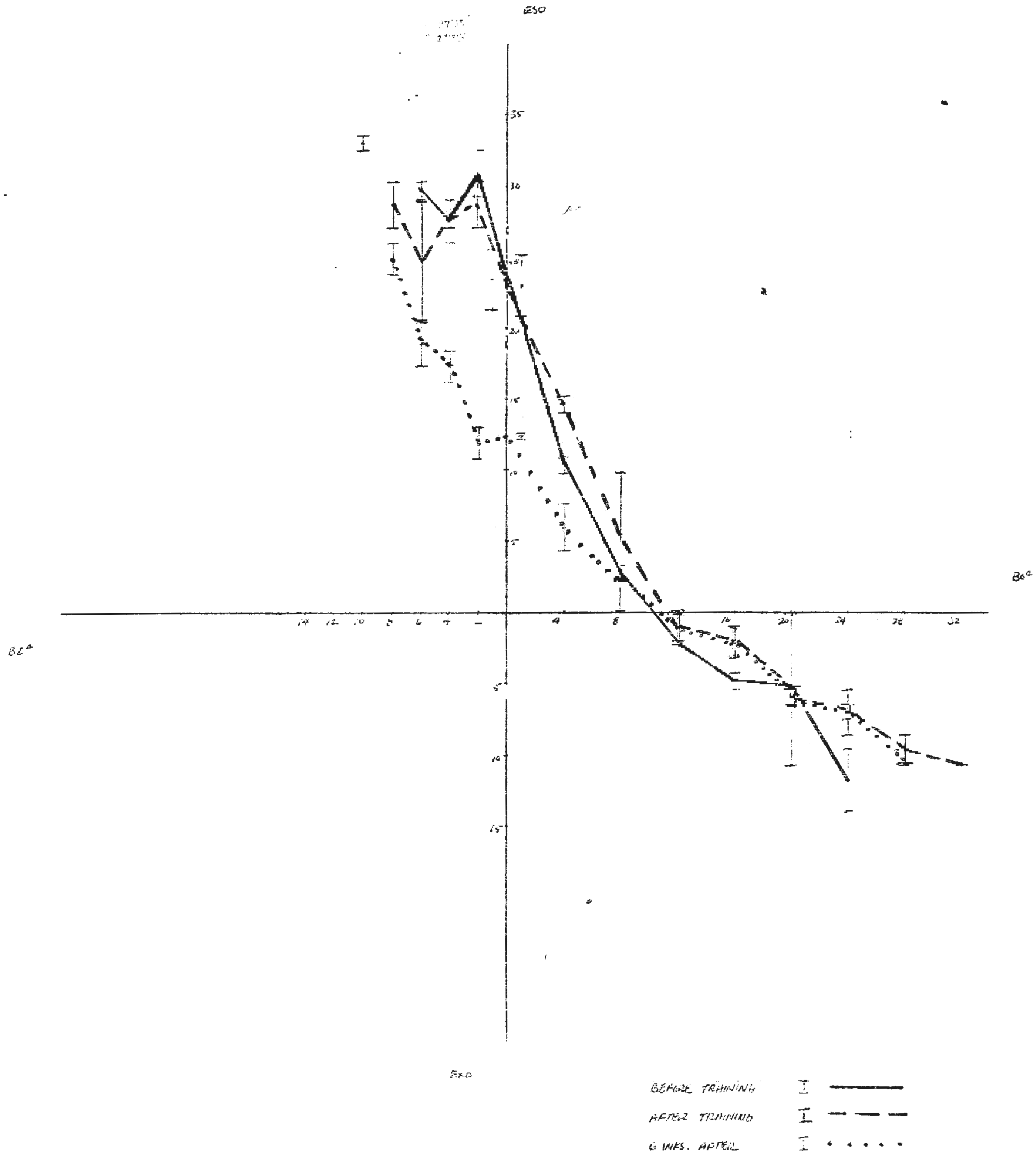
LENSES @ 4.25 M

NO. 18



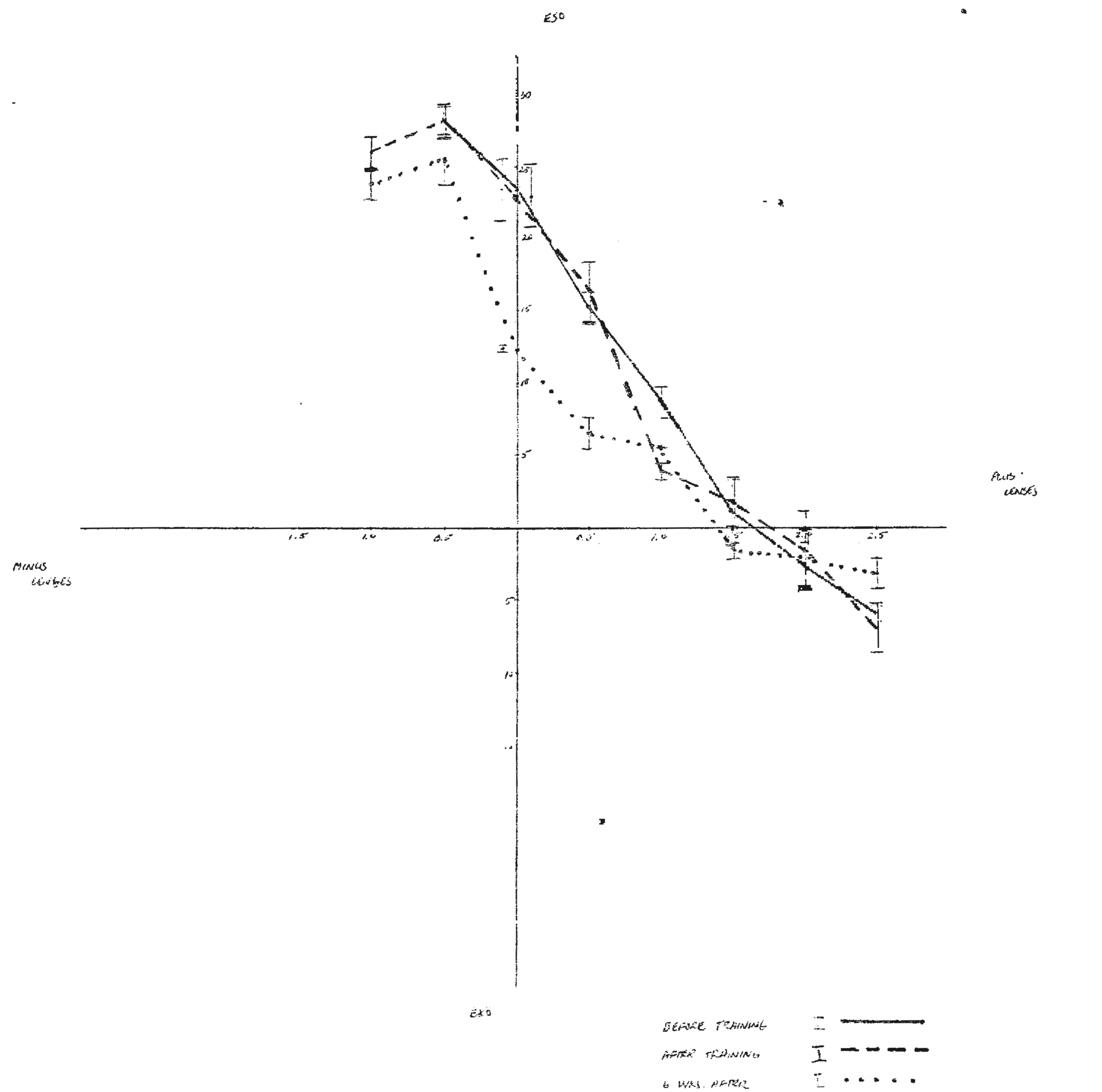
J.M.
PRISM @ 40 CM

NO. 18



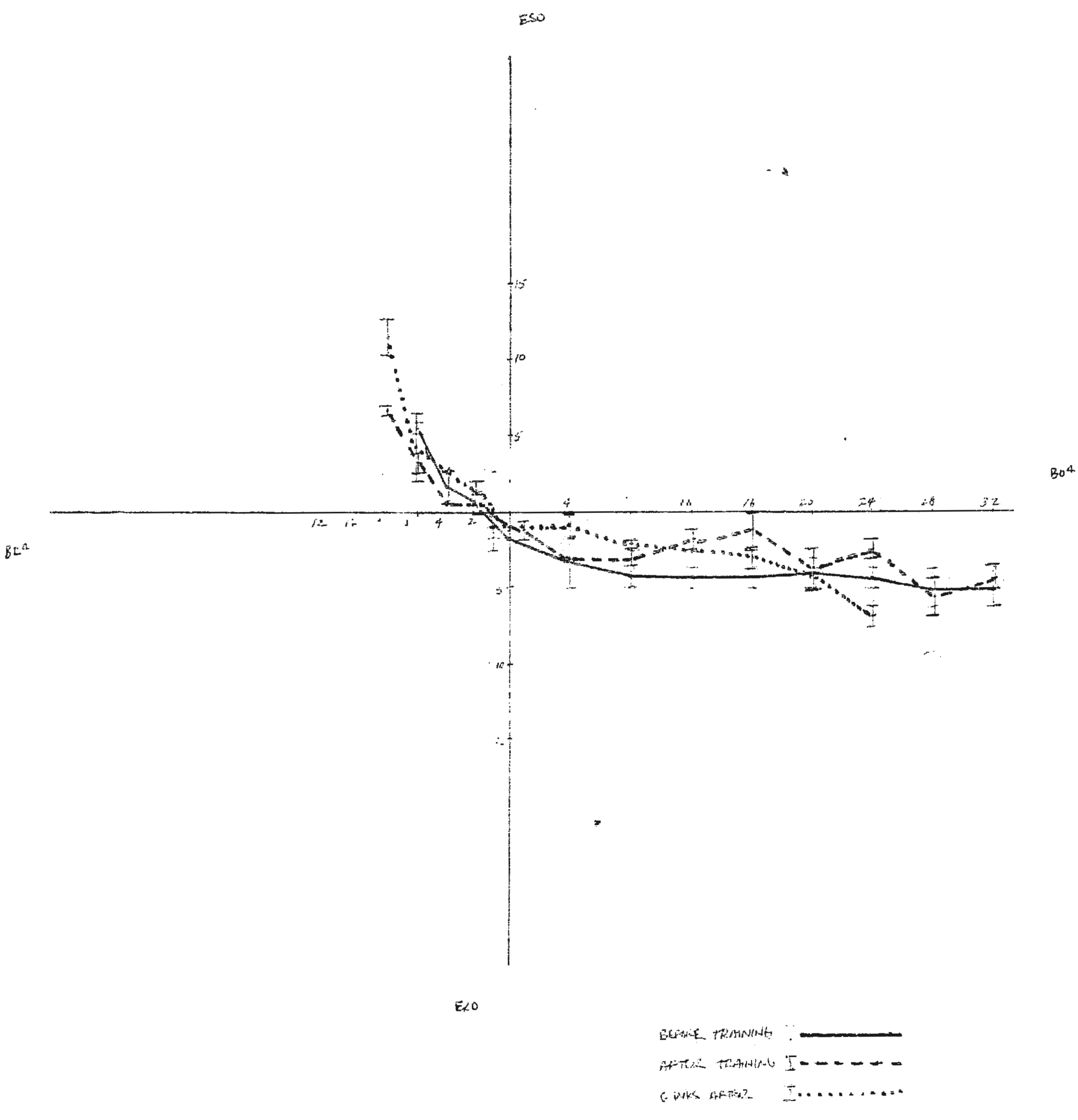
J.M.
LENSES @ 40CM

NO. 18



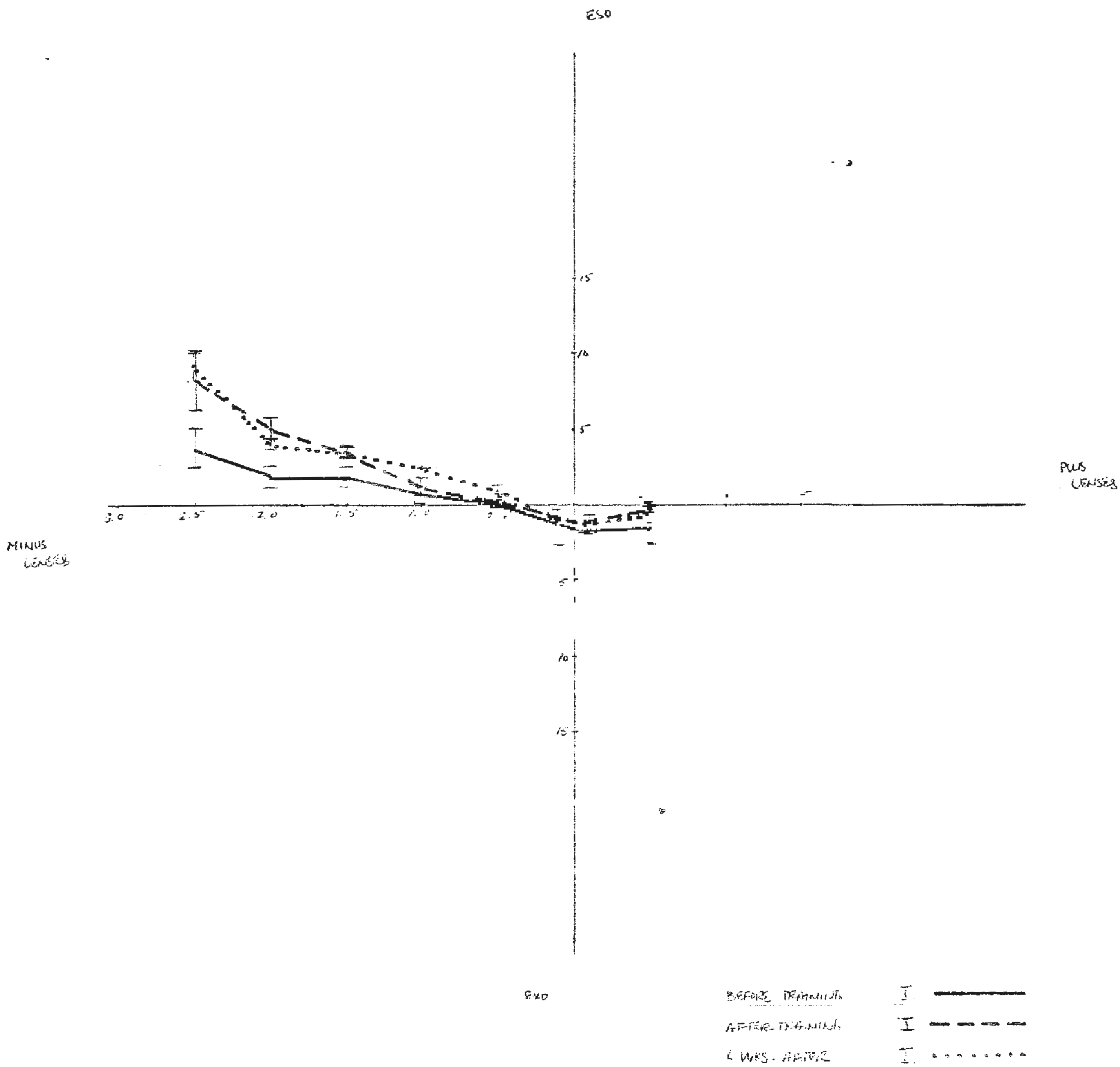
P.S.
PRISM @ 4.25M

NO. 19



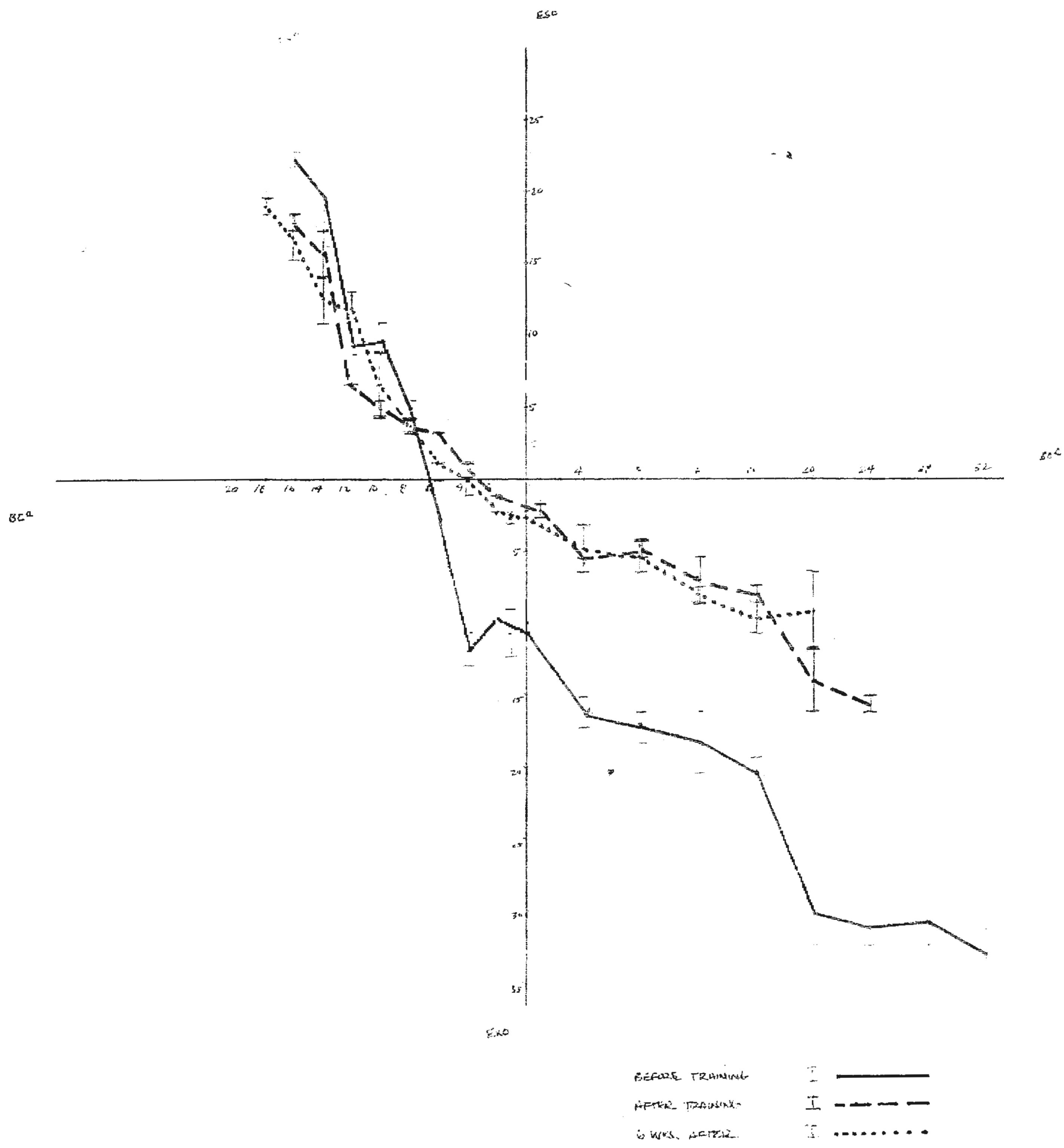
P.S.
LENSES @ 4.25 M

NO. 19



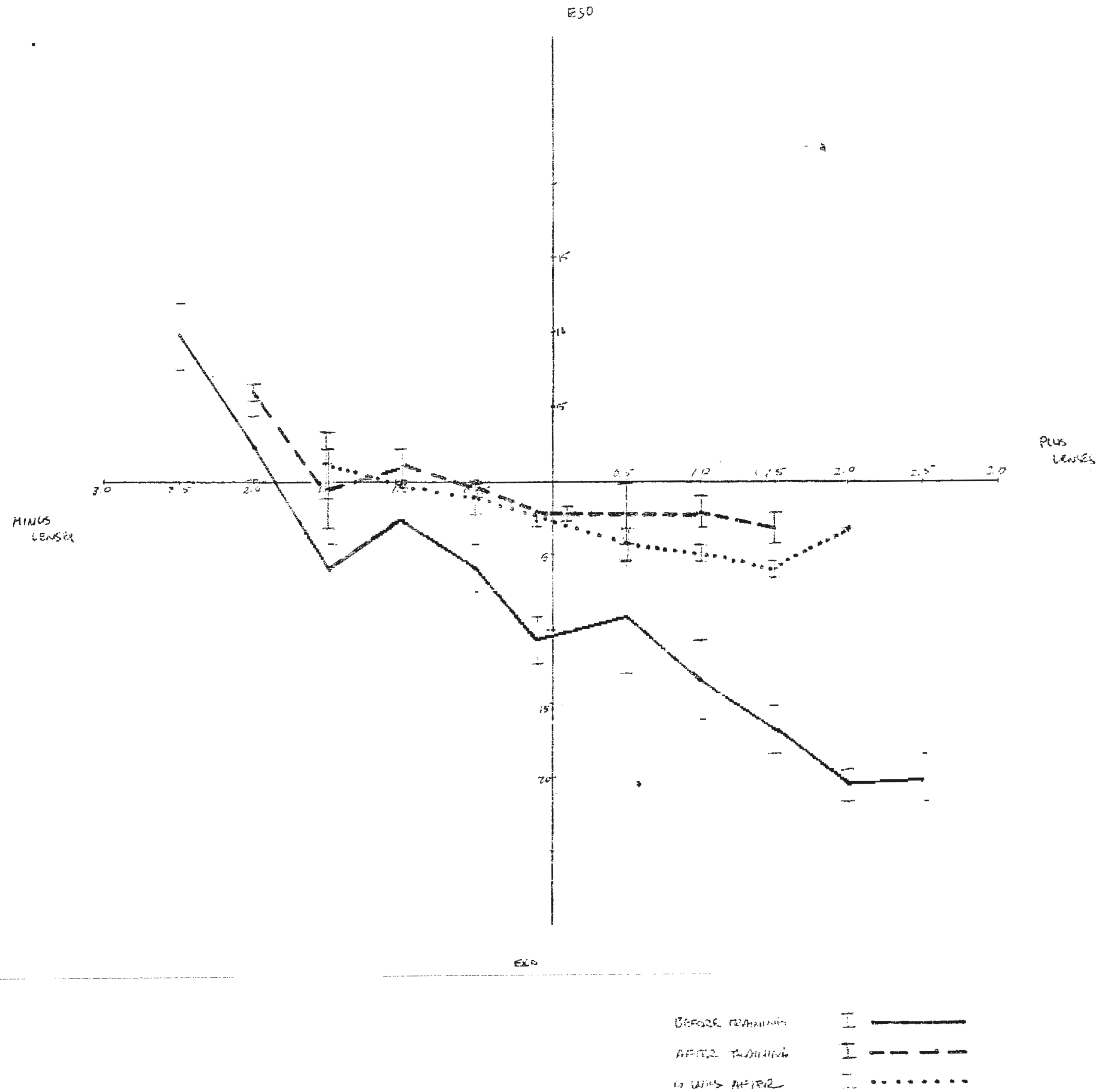
P.S.
PRISM @ 40 CM

NO. 19

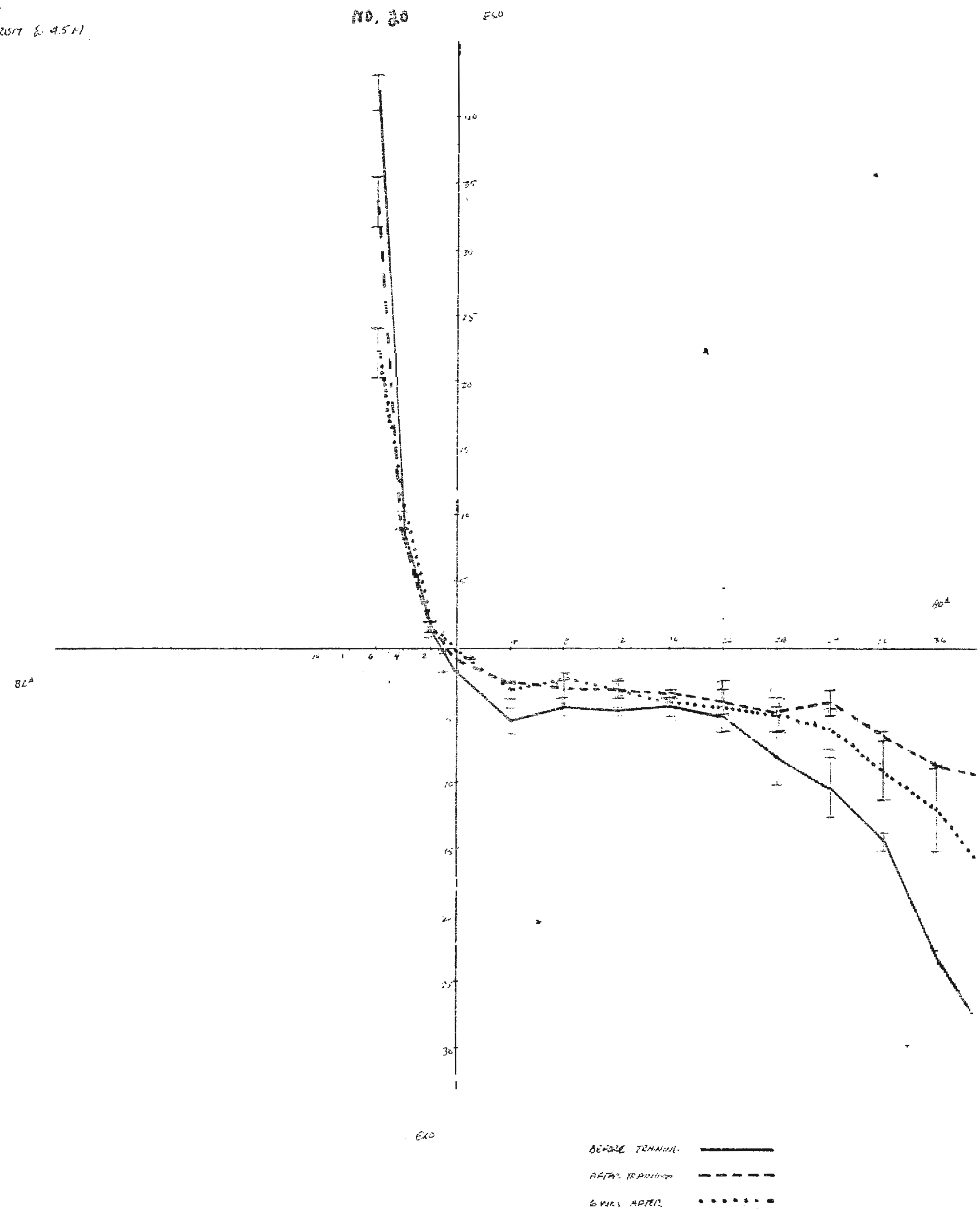


P.S.
LENSES @ 40 CM

NO. 19



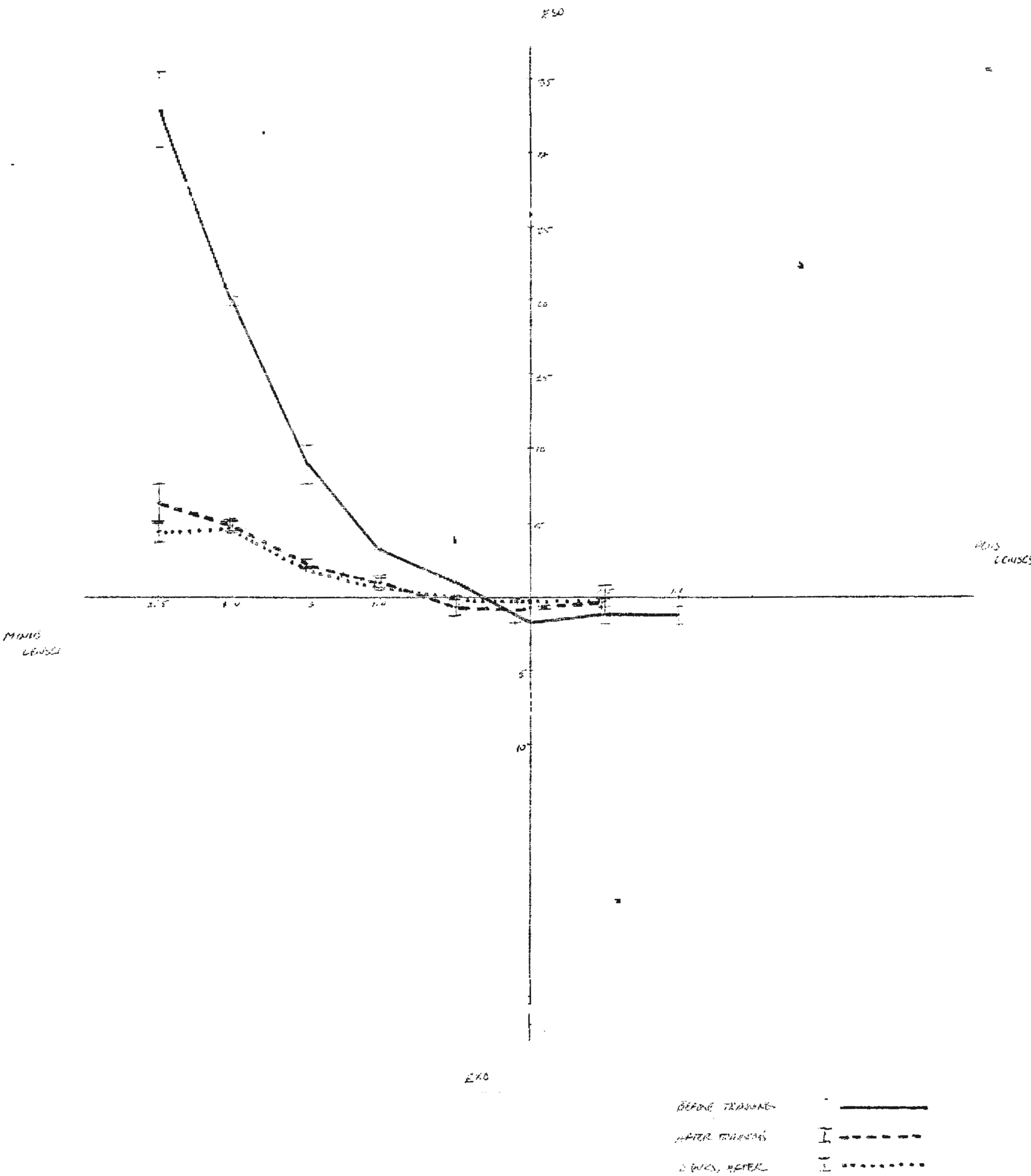
S.V.
PRSIT & 4.5 M


NO. 30
ESO
BL^Δ
BO^Δ
EXO
BEFORE TRAINING
AFTER TRAINING
6 WKS AFTER

S.V.

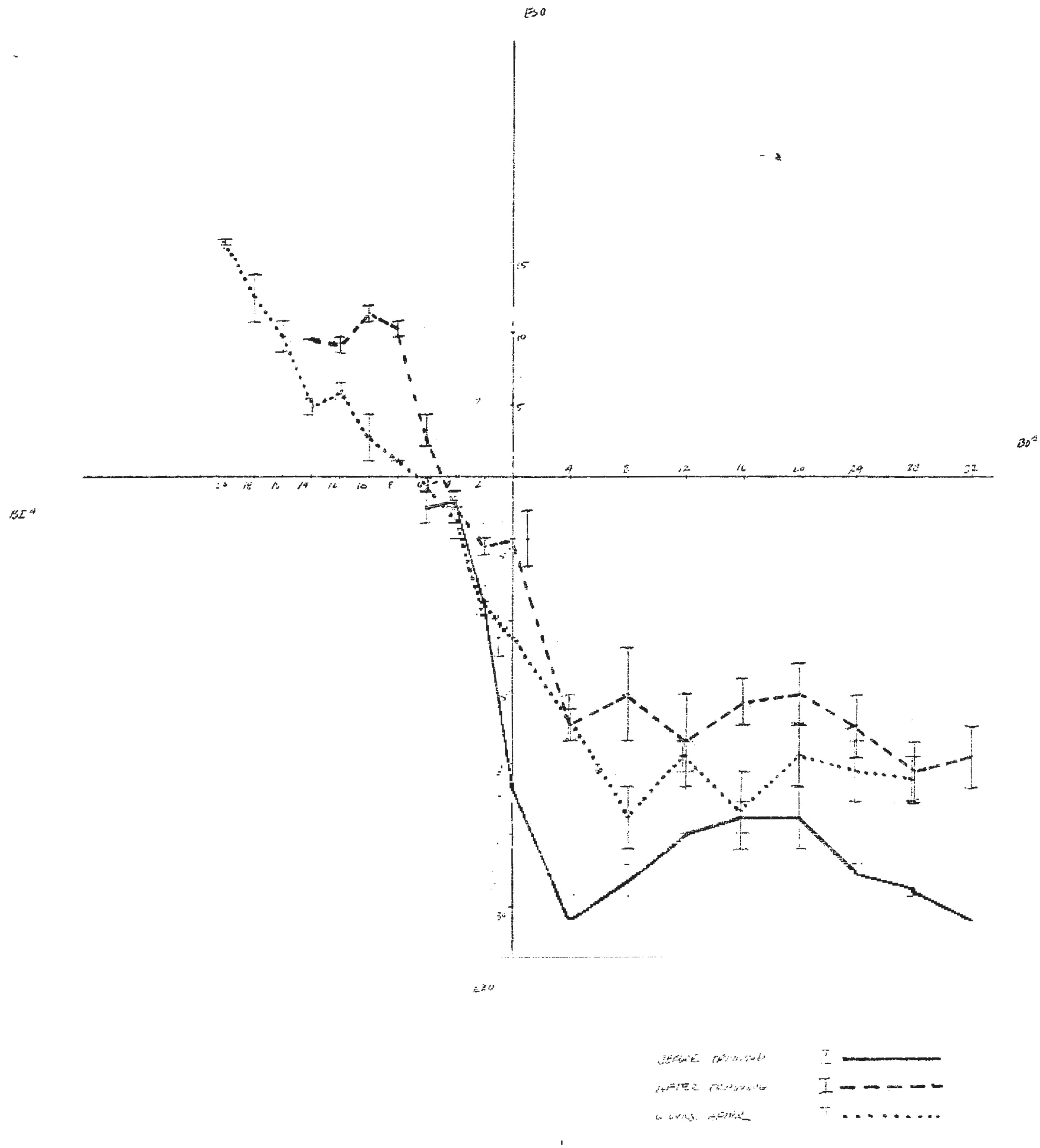
LENSES @ 4.5 M

NO. 20



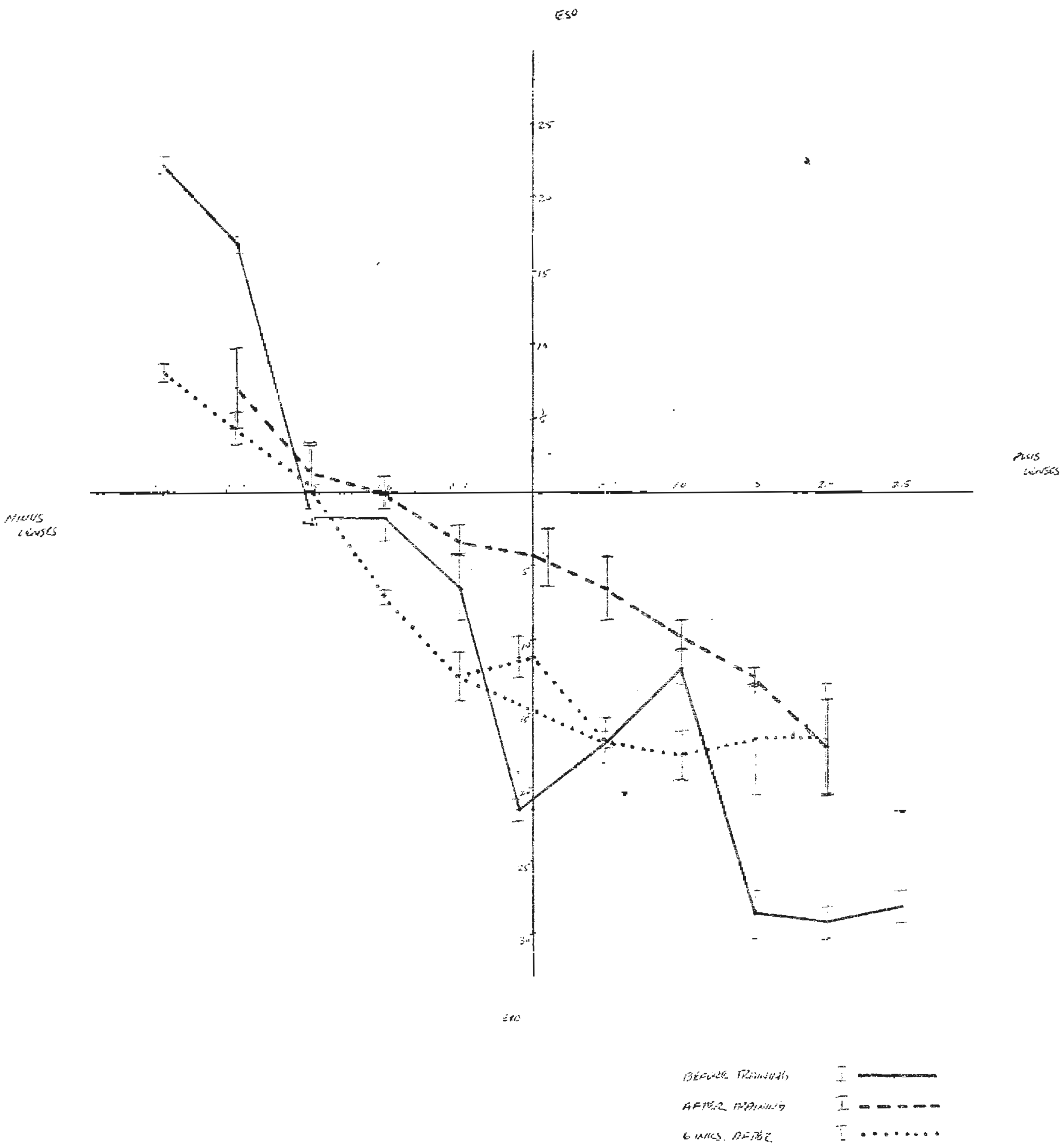
S.V.
PRISM @ 40CM

NO. 20



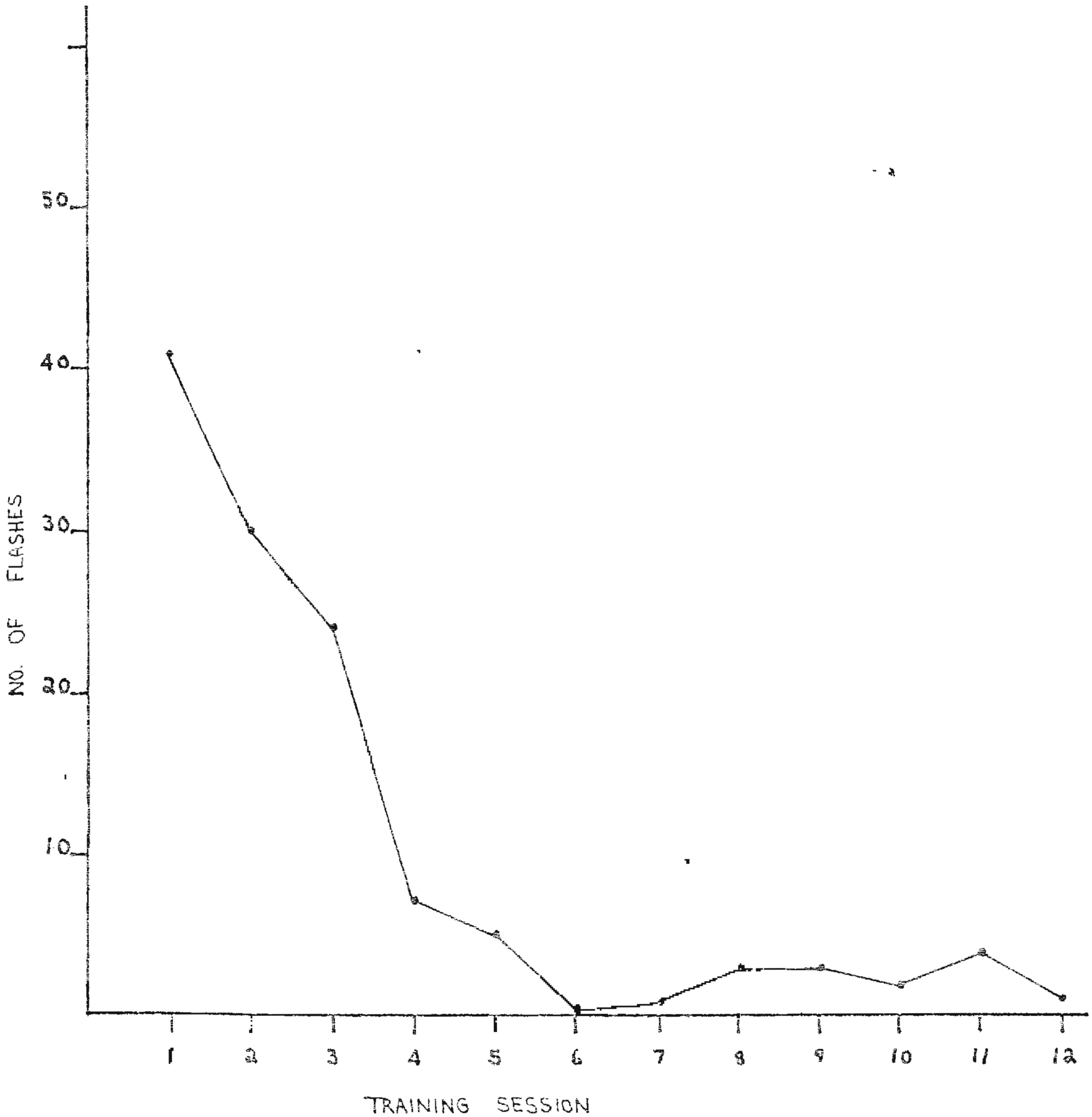
S.V.
LENSES @ 40CM

NO. 20

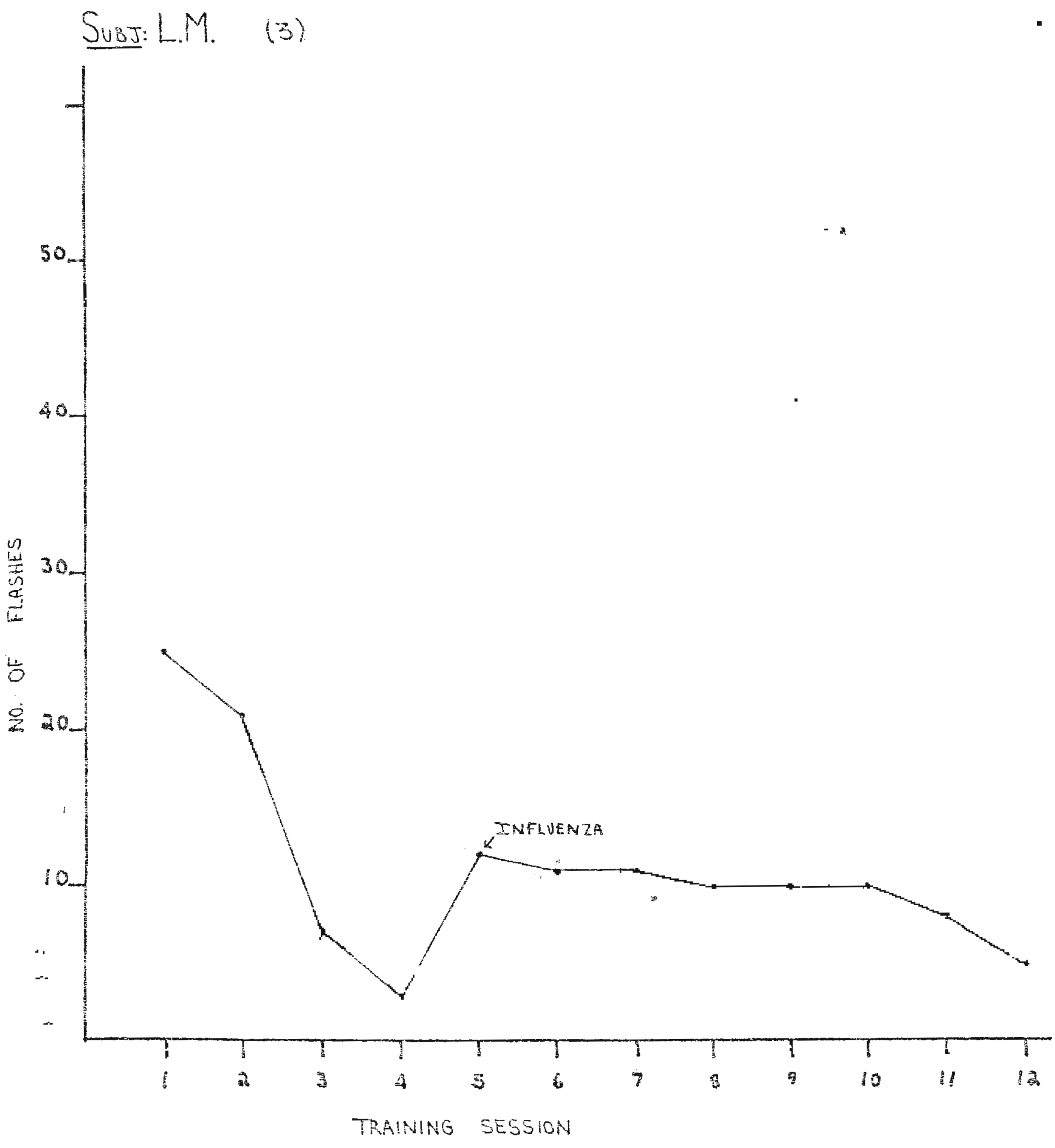


APPENDIX E

Subj: L.C. no. 2.

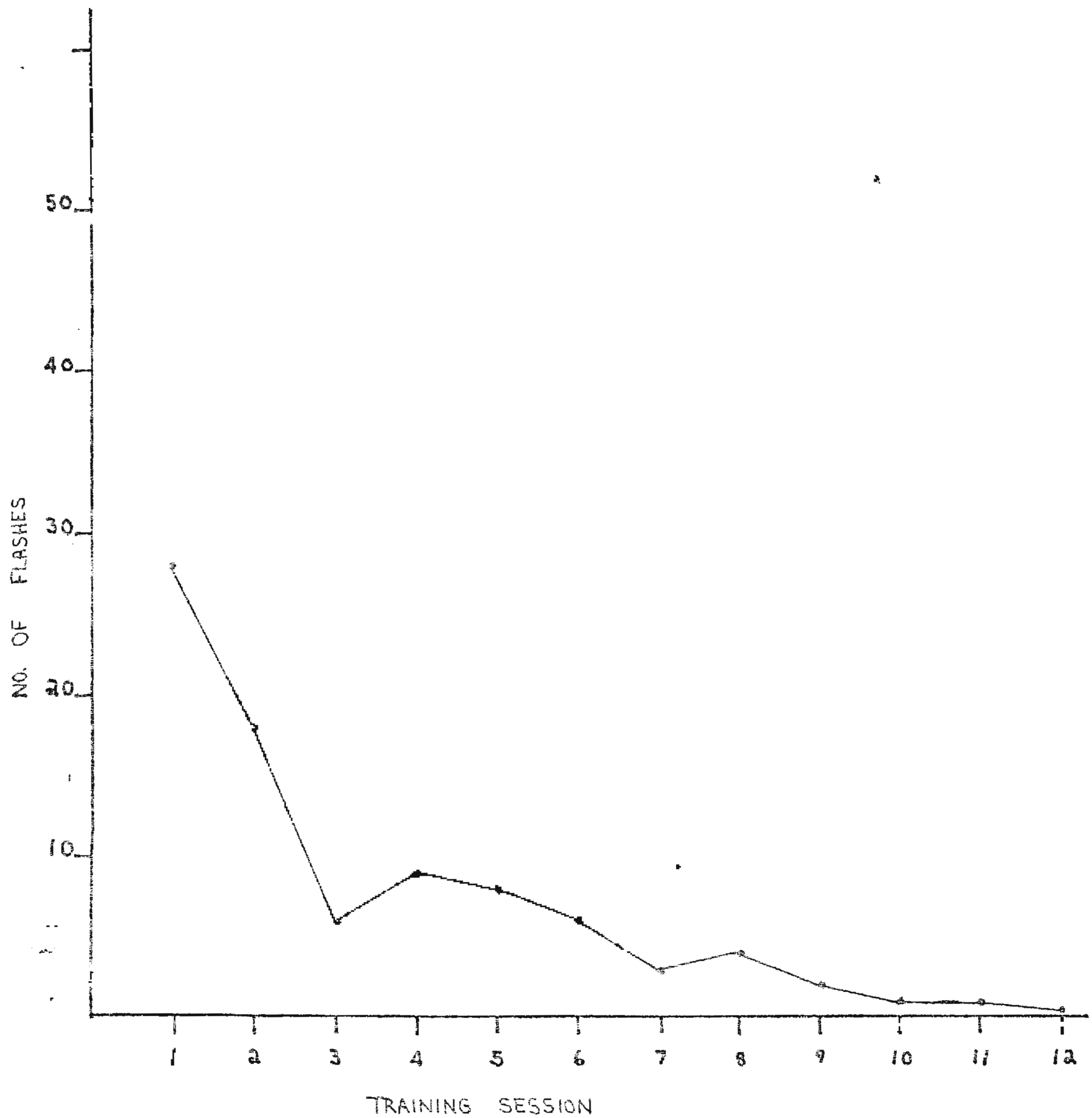


NO. OF FLASHES
50
40
30
20
10
1
2
3
4
5
6
7
8
9
10
11
12
TRAINING SESSION

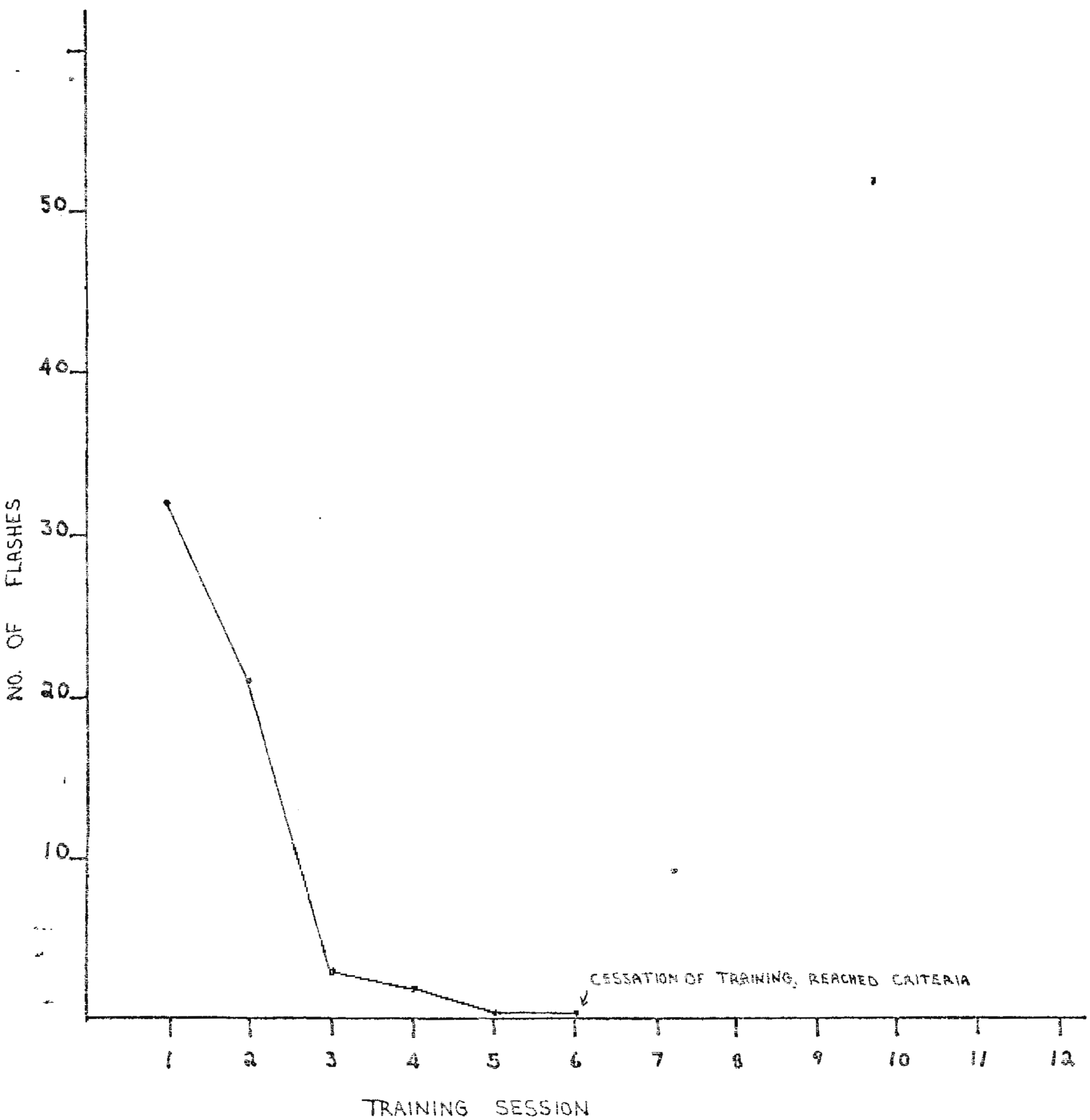


SUBJ: L.M. (3)
50
40
30
20
10
NO. OF FLASHES
INFLUENZA
1
2
3
4
5
6
7
8
9
10
11
12
TRAINING SESSION

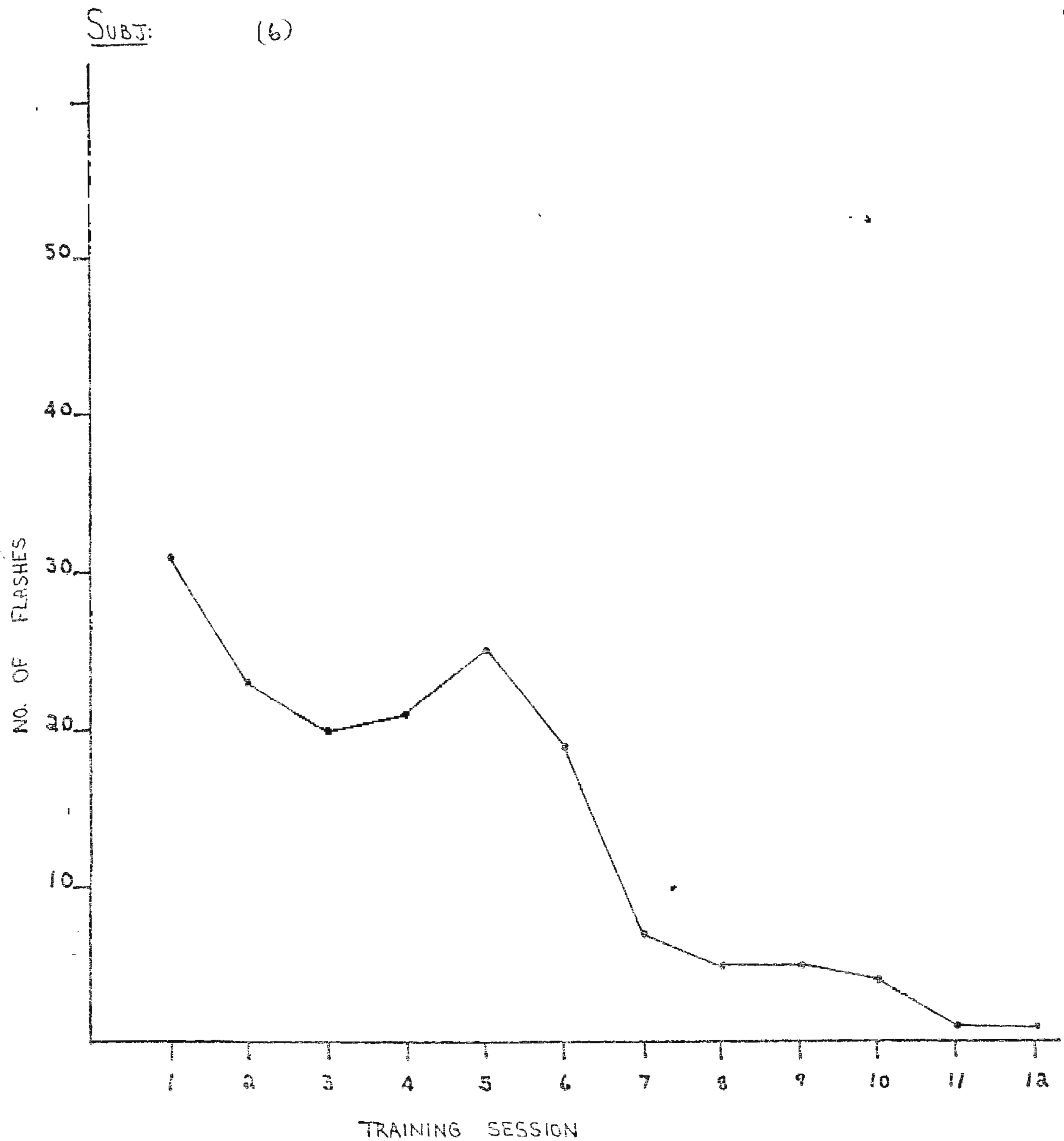
SUBJ: R.L. (4)


50
40
30
20
10
NO. OF FLASHES
1
2
3
4
5
6
7
8
9
10
11
12
TRAINING SESSION

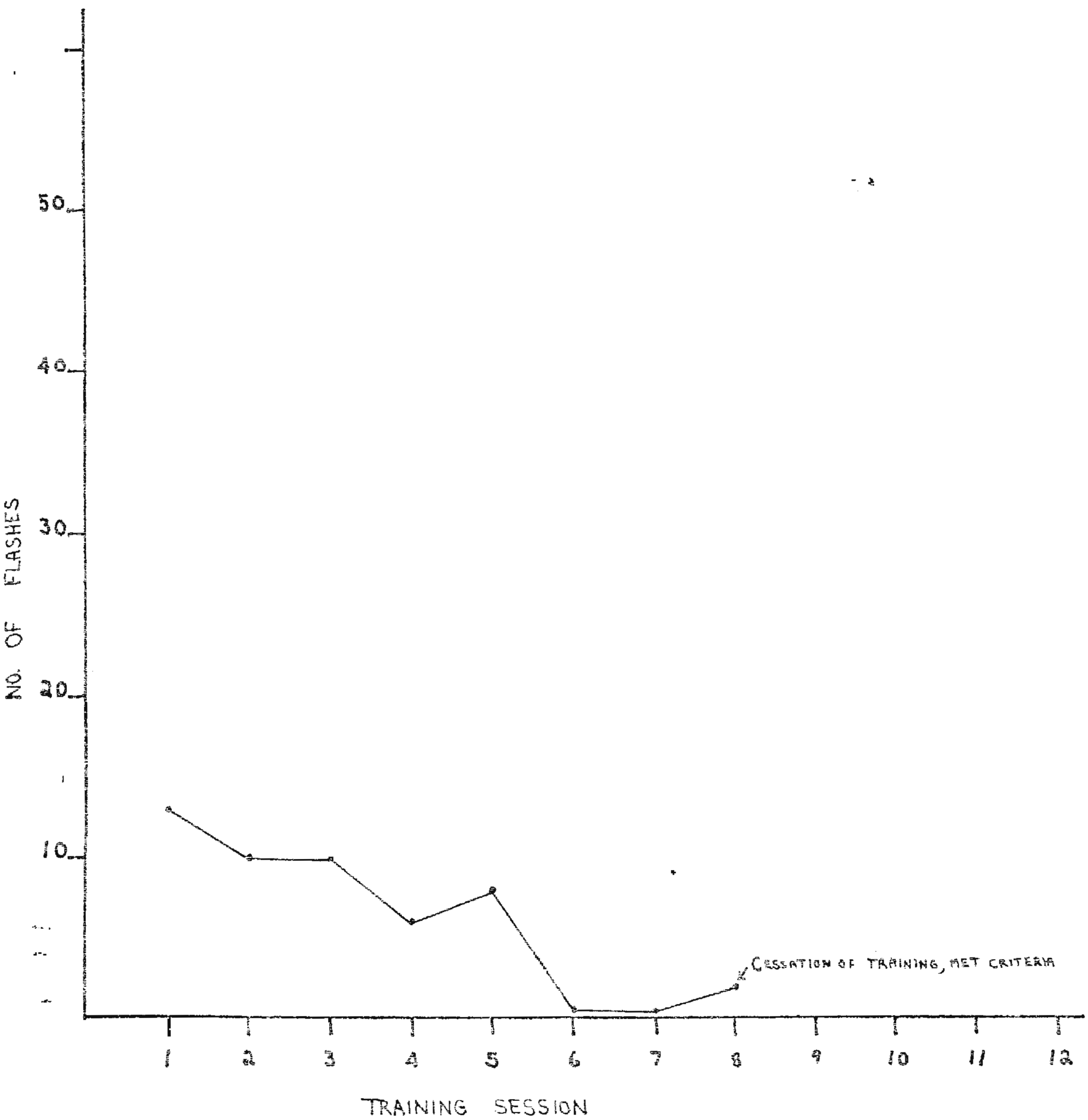
Subj: S.S. (5)



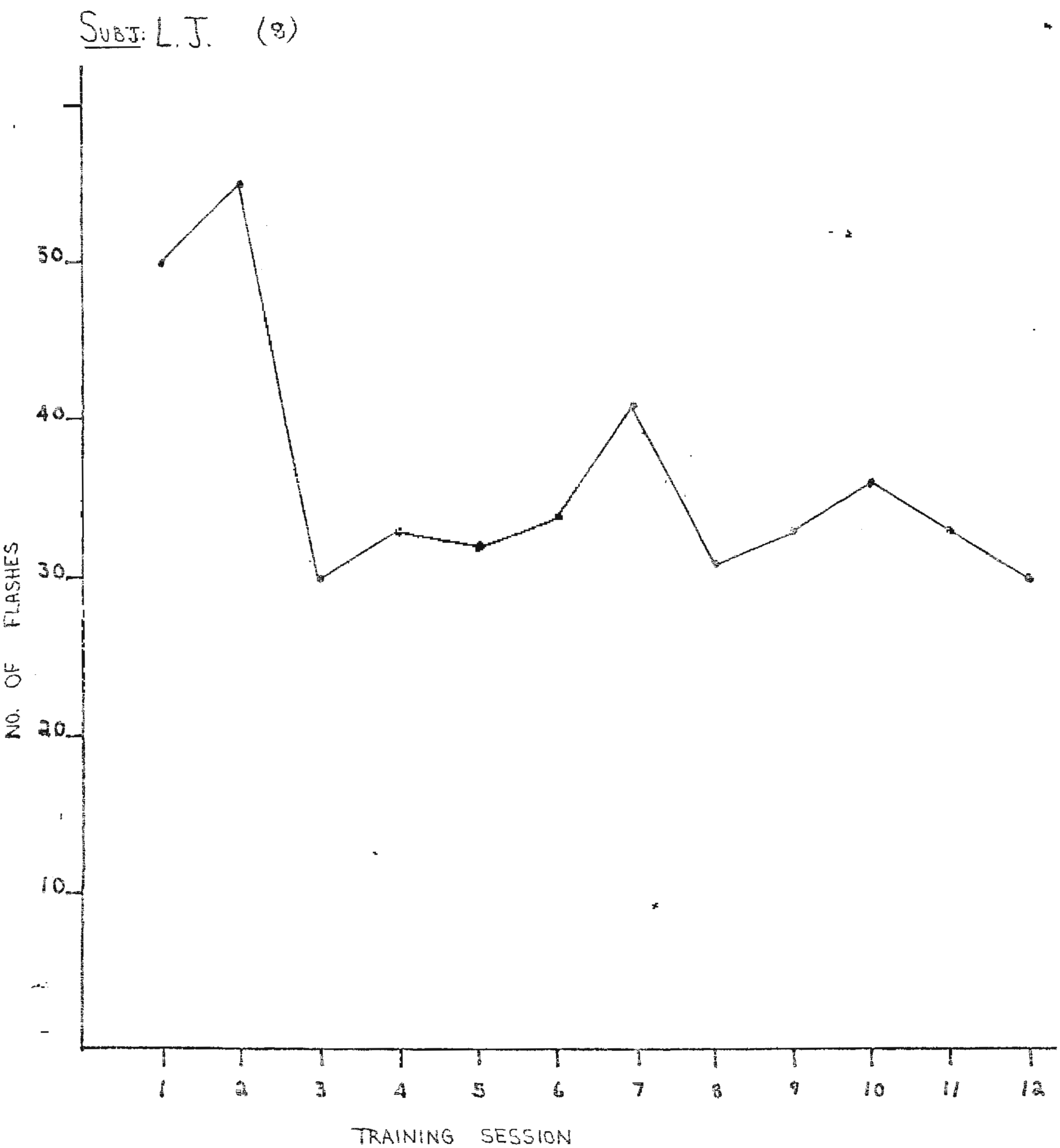
50
40
30
20
10
NO. OF FLASHES
CESSATION OF TRAINING, REACHED CRITERIA
1
2
3
4
5
6
7
8
9
10
11
12
TRAINING SESSION


SUBJ: (6)
NO. OF FLASHES
50
40
30
20
10
1 2 3 4 5 6 7 8 9 10 11 12
TRAINING SESSION

Subj: S.N. (7)

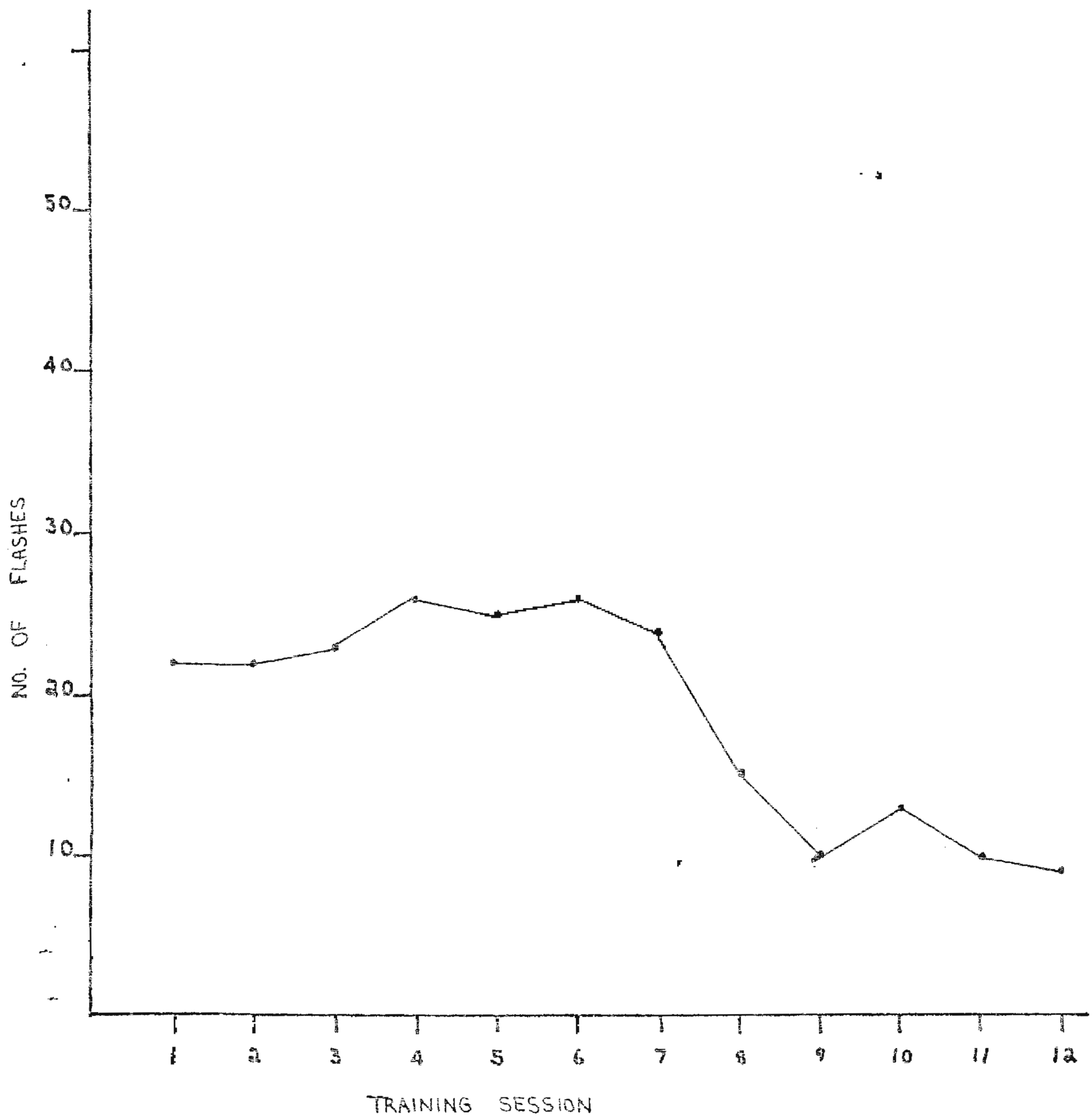


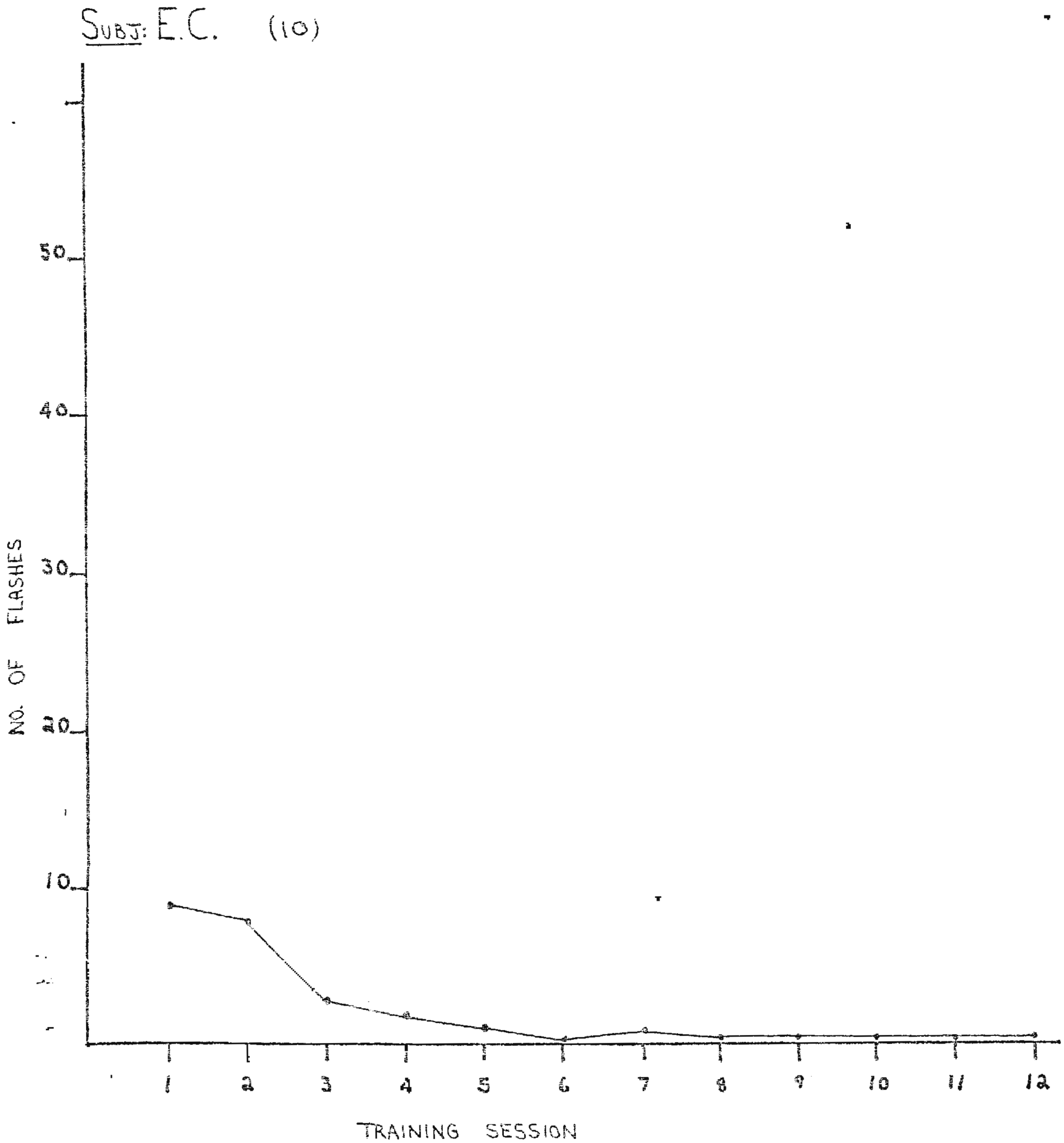
NO. OF FLASHES
50
40
30
20
10
1
2
3
4
5
6
7
8
9
10
11
12
TRAINING SESSION
Cessation of training, met criteria



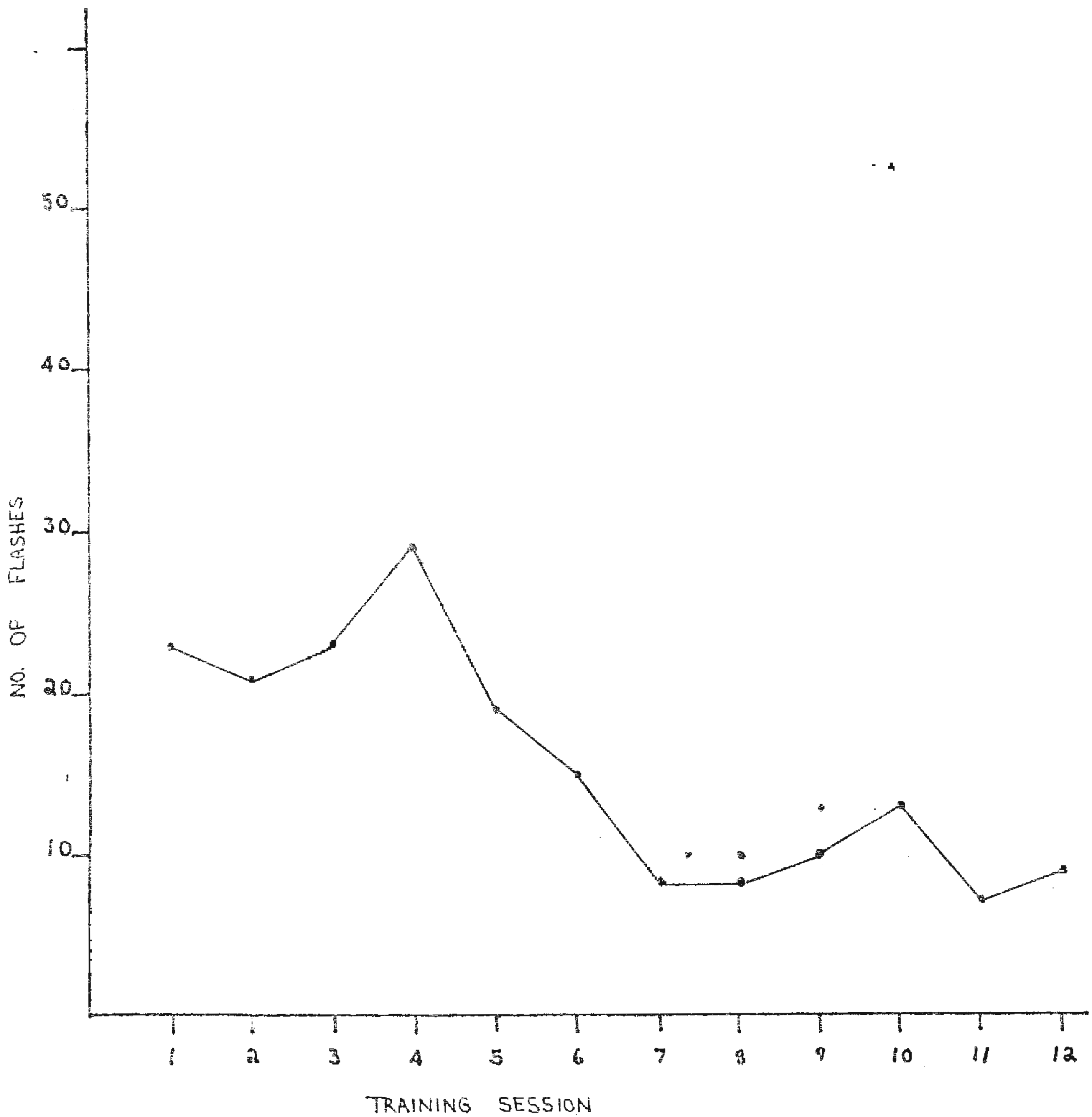
SUBJ: L.J. (8)
NO. OF FLASHES
50
40
30
20
10
1
2
3
4
5
6
7
8
9
10
11
12
TRAINING SESSION

Subj: P.K. (9)

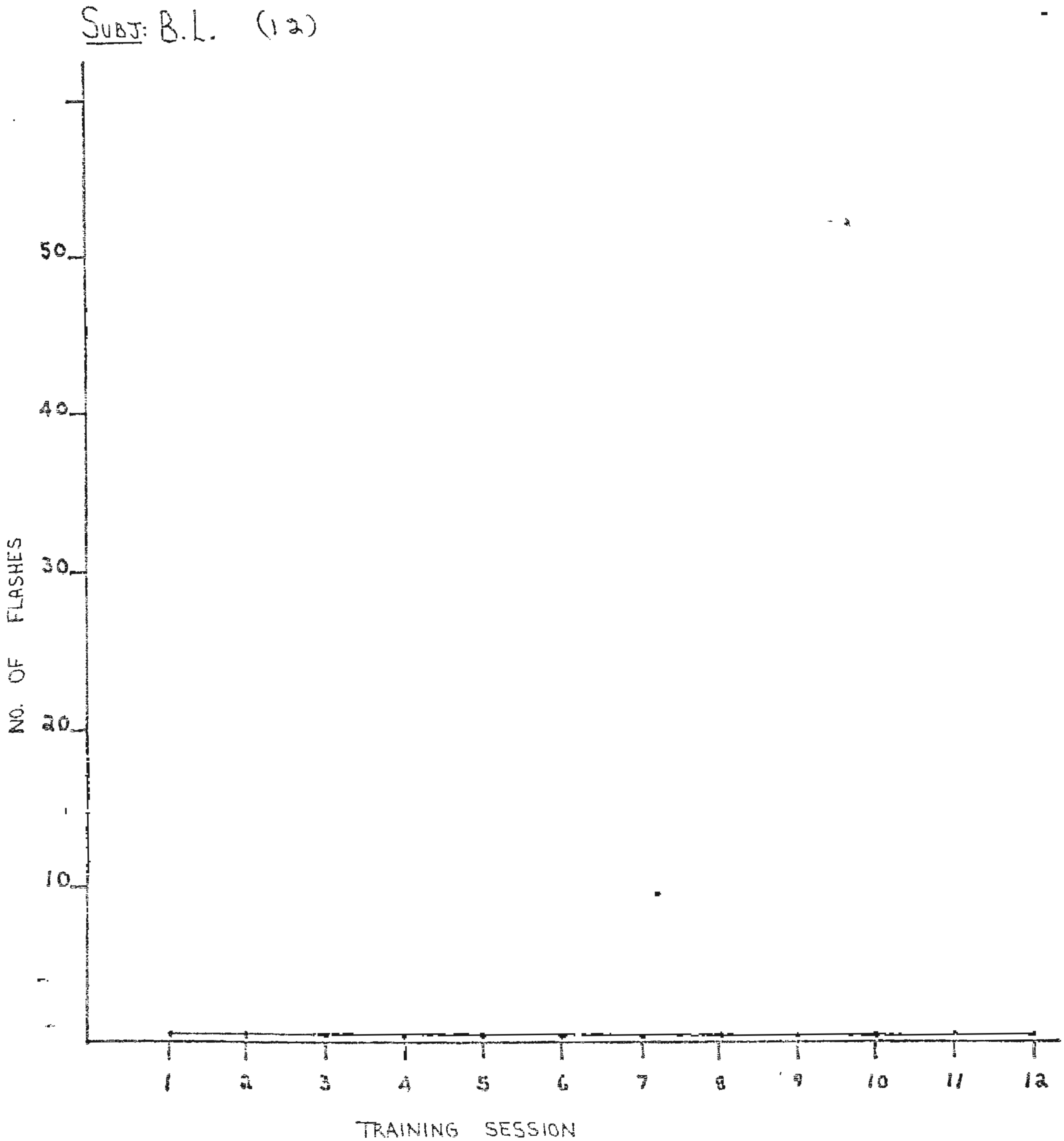

50
40
30
20
10
NO. OF FLASHES
1
2
3
4
5
6
7
8
9
10
11
12
TRAINING SESSION

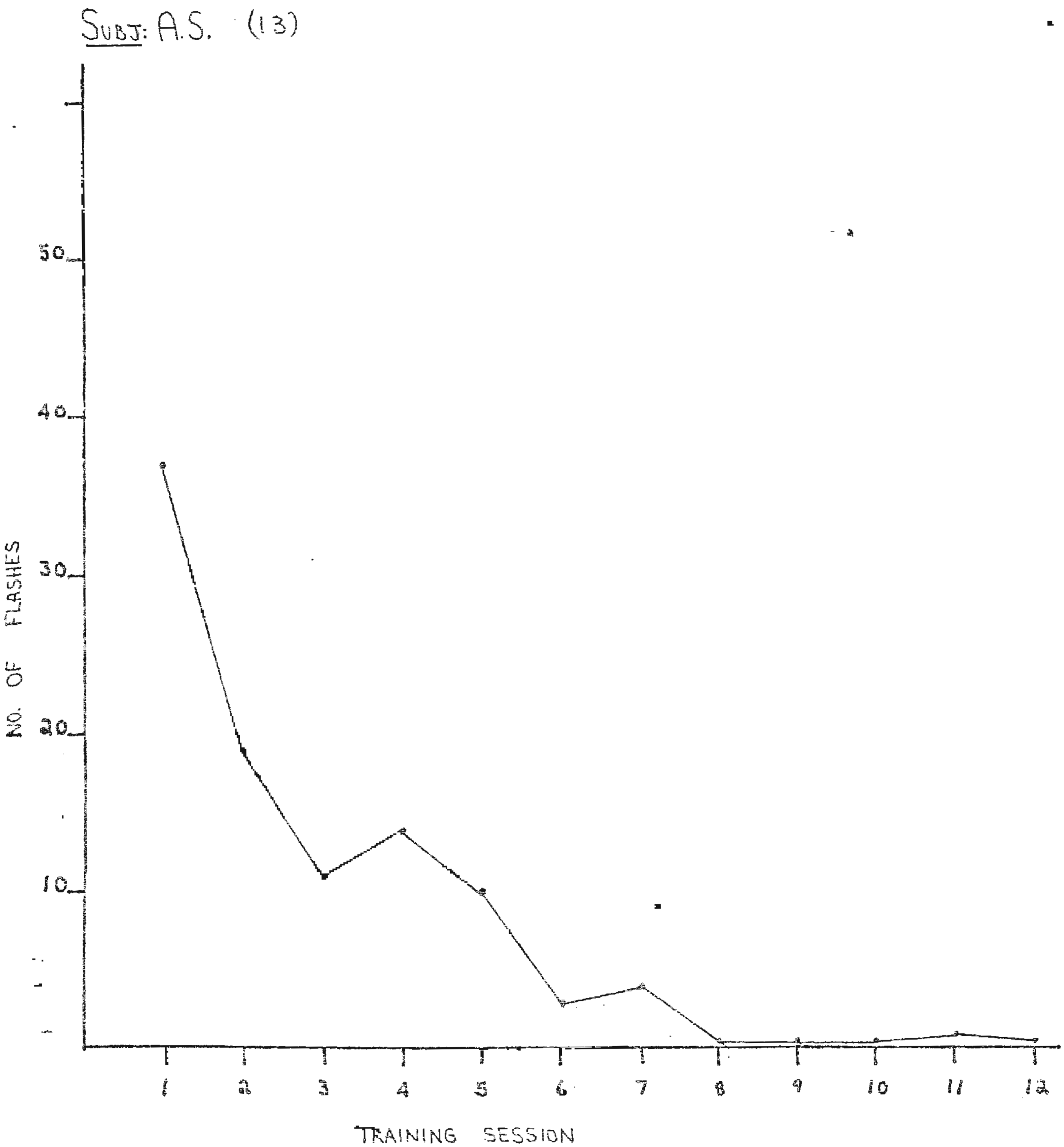

Subj: E.C. (10)
50
40
30
20
10
NO. OF FLASHES
1
2
3
4
5
6
7
8
9
10
11
12
TRAINING SESSION

Subj: T.K. (11)



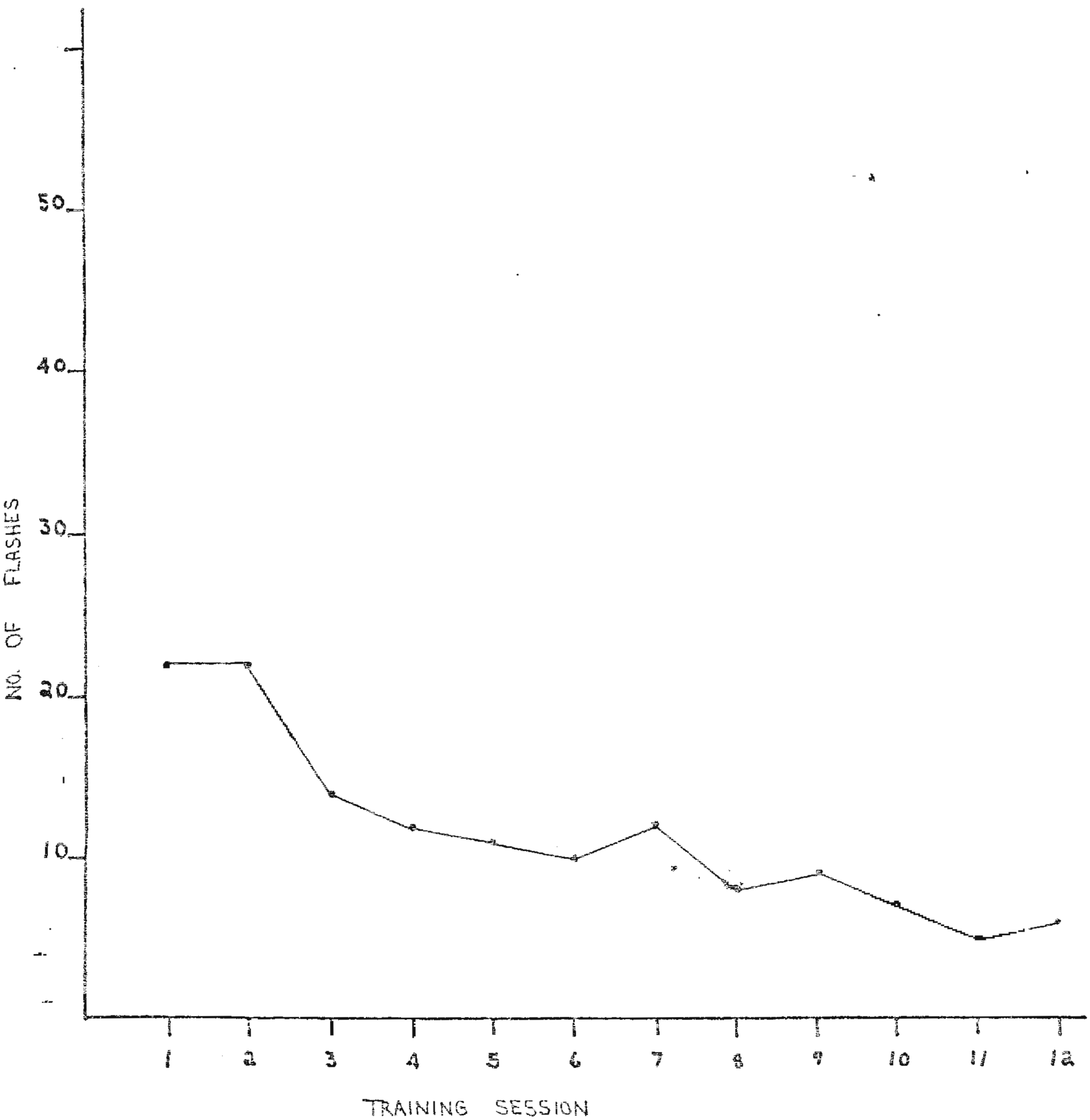
50
40
30
20
10
NO. OF FLASHES
1
2
3
4
5
6
7
8
9
10
11
12
TRAINING SESSION


SUBJ: B.L. (12)
50
40
30
20
10
NO. OF FLASHES
1
2
3
4
5
6
7
8
9
10
11
12
TRAINING SESSION



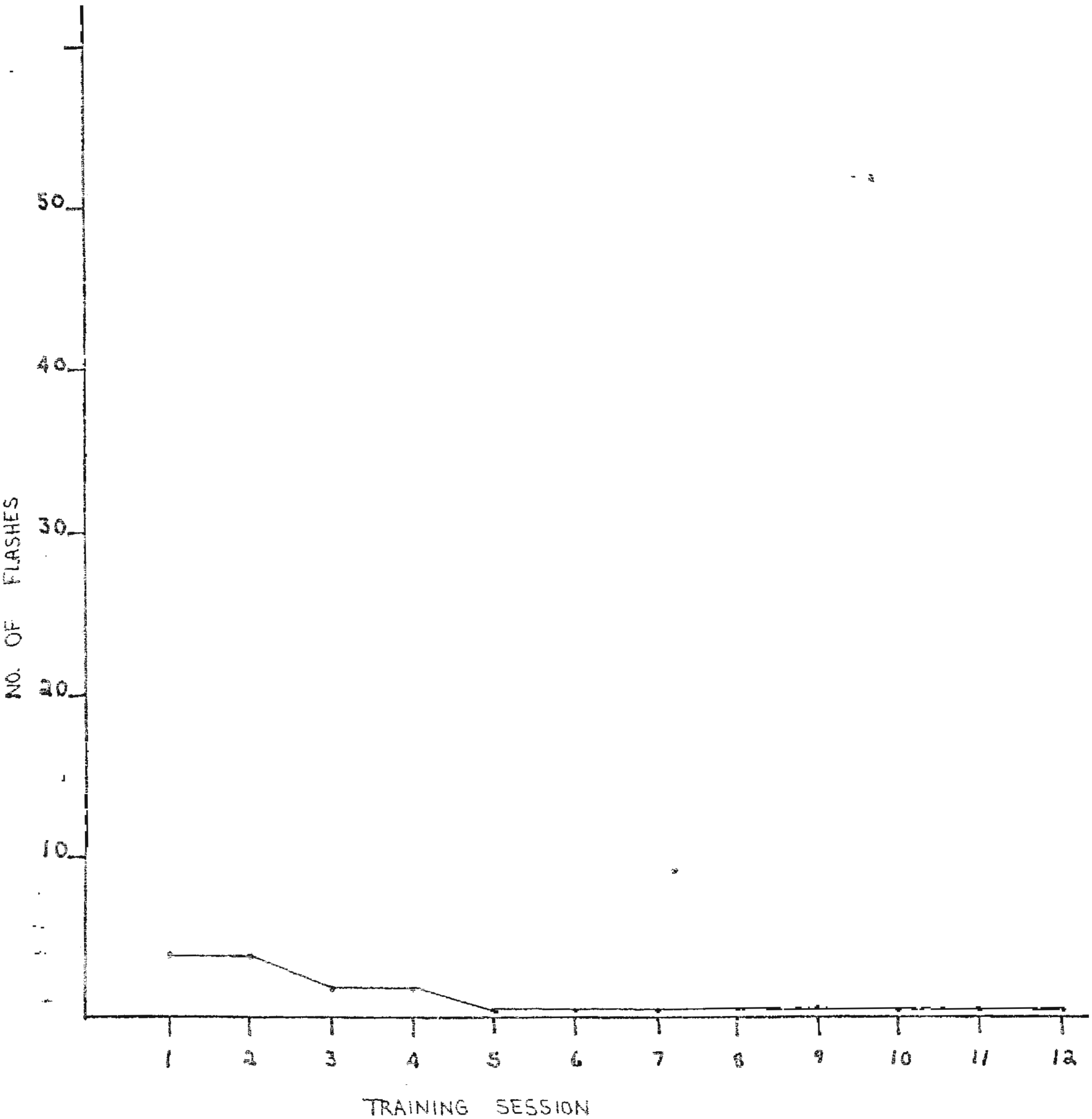
SUBJ: A.S. (13)
NO. OF FLASHES
50
40
30
20
10
1
2
3
4
5
6
7
8
9
10
11
12
TRAINING SESSION

Subj: H.F. (14)



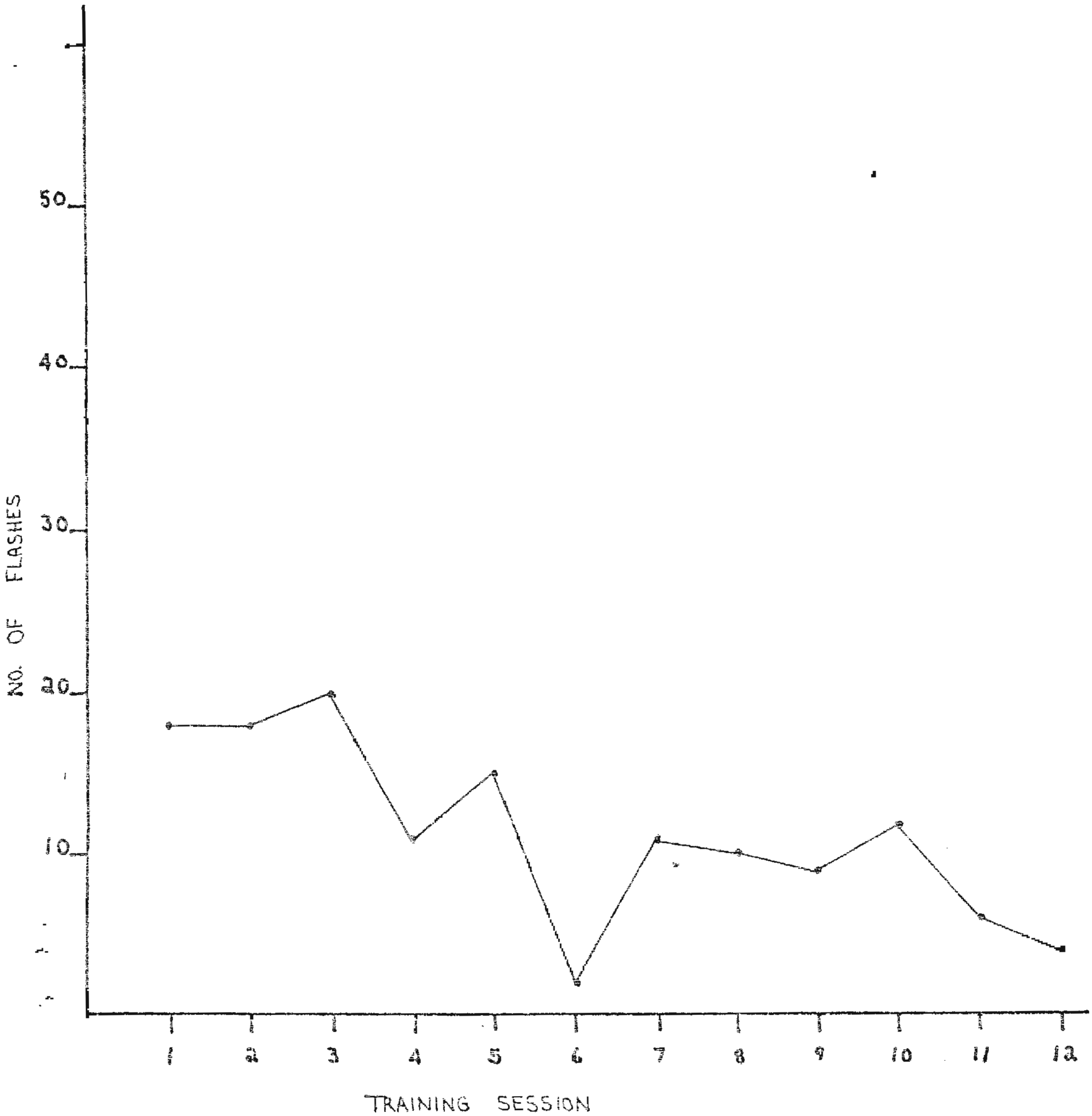
50
40
30
20
10
NO. OF FLASHES
1
2
3
4
5
6
7
8
9
10
11
12
TRAINING SESSION

SUBJ: J.M. (13)



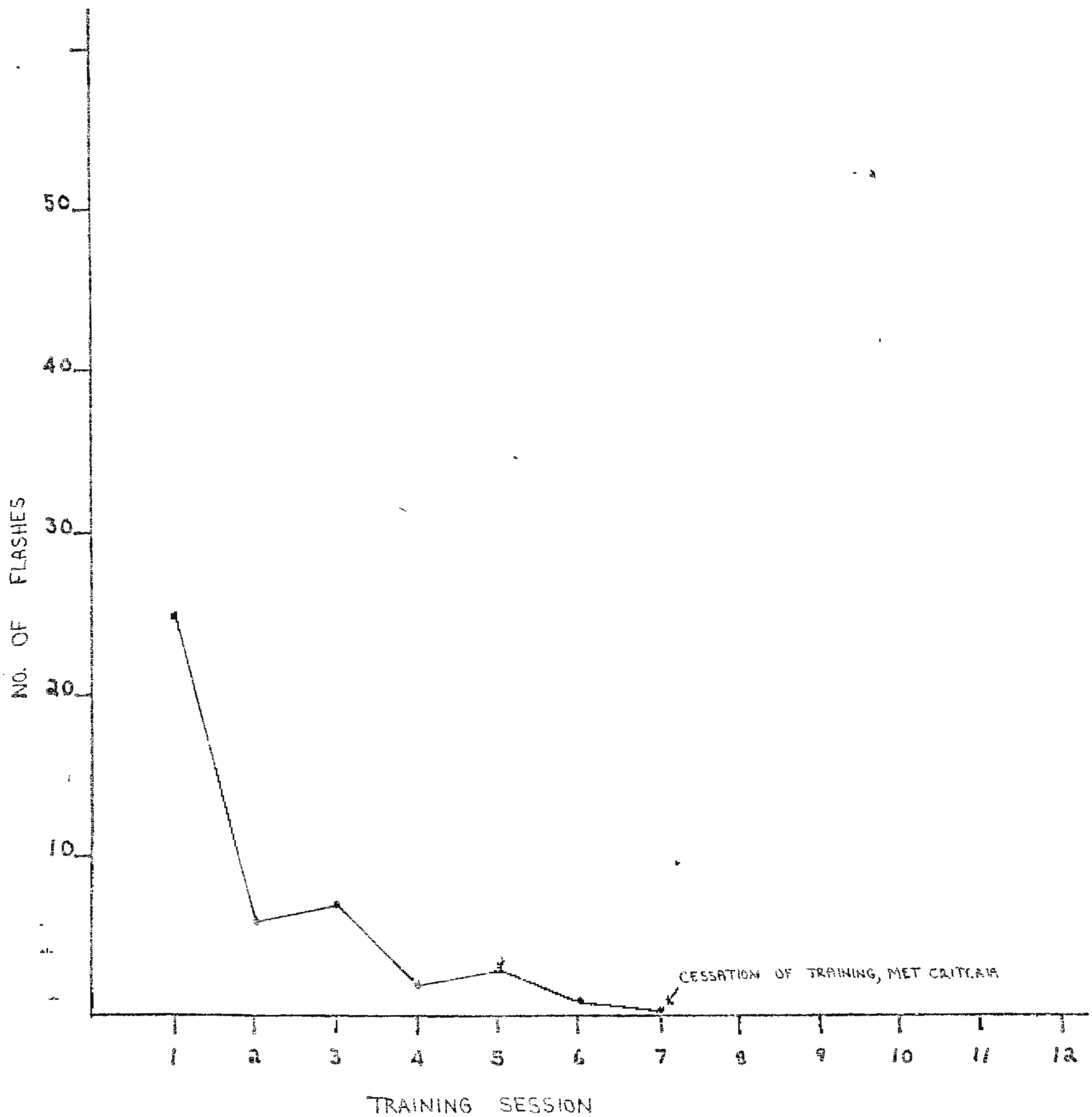
NO. OF FLASHES
50
40
30
20
10
1
2
3
4
5
6
7
8
9
10
11
12
TRAINING SESSION

Subj: M.W. (16)



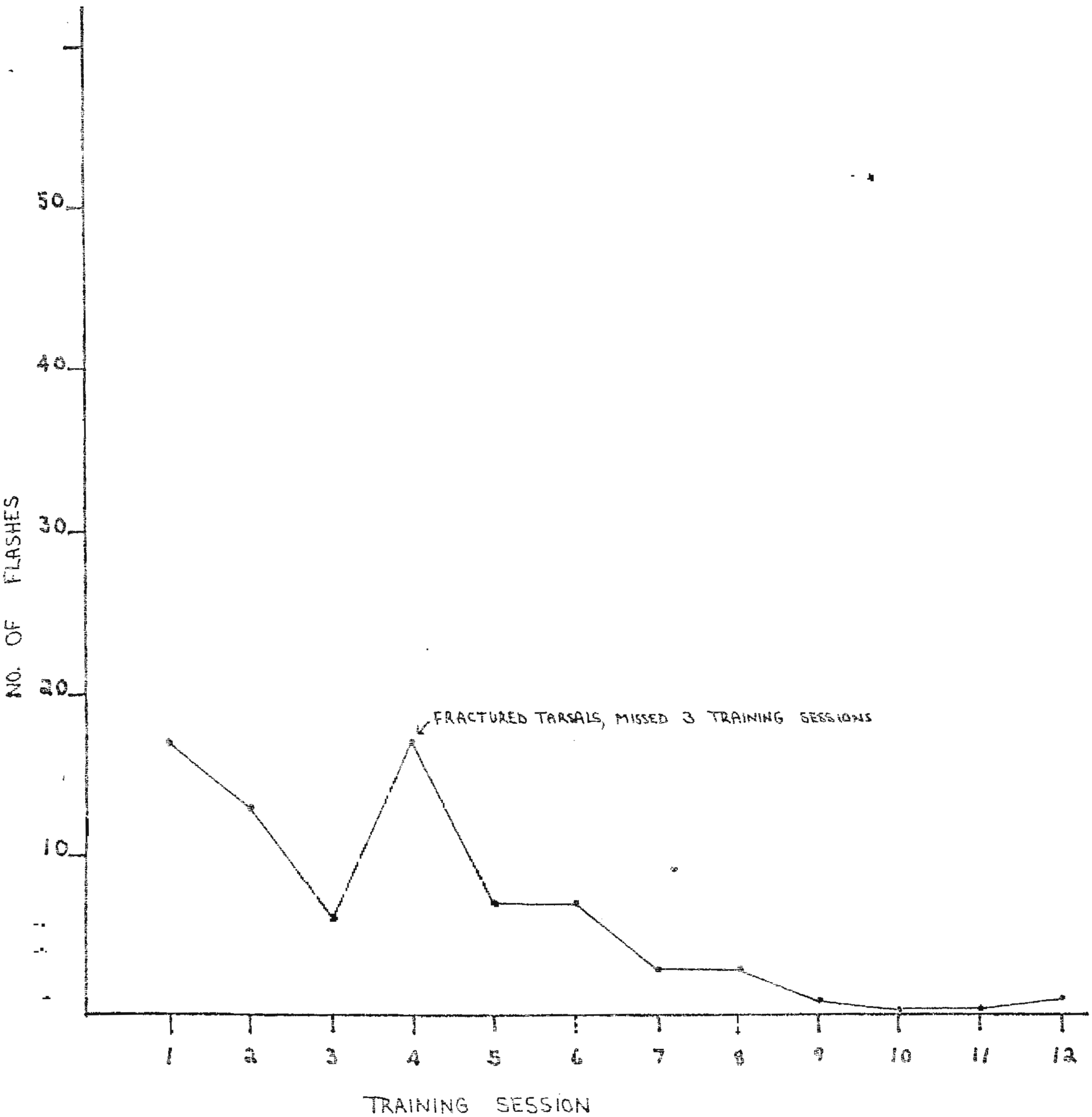
50
40
30
20
10
NO. OF FLASHES
1
2
3
4
5
6
7
8
9
10
11
12
TRAINING SESSION

SUBJ: J.L. (17)

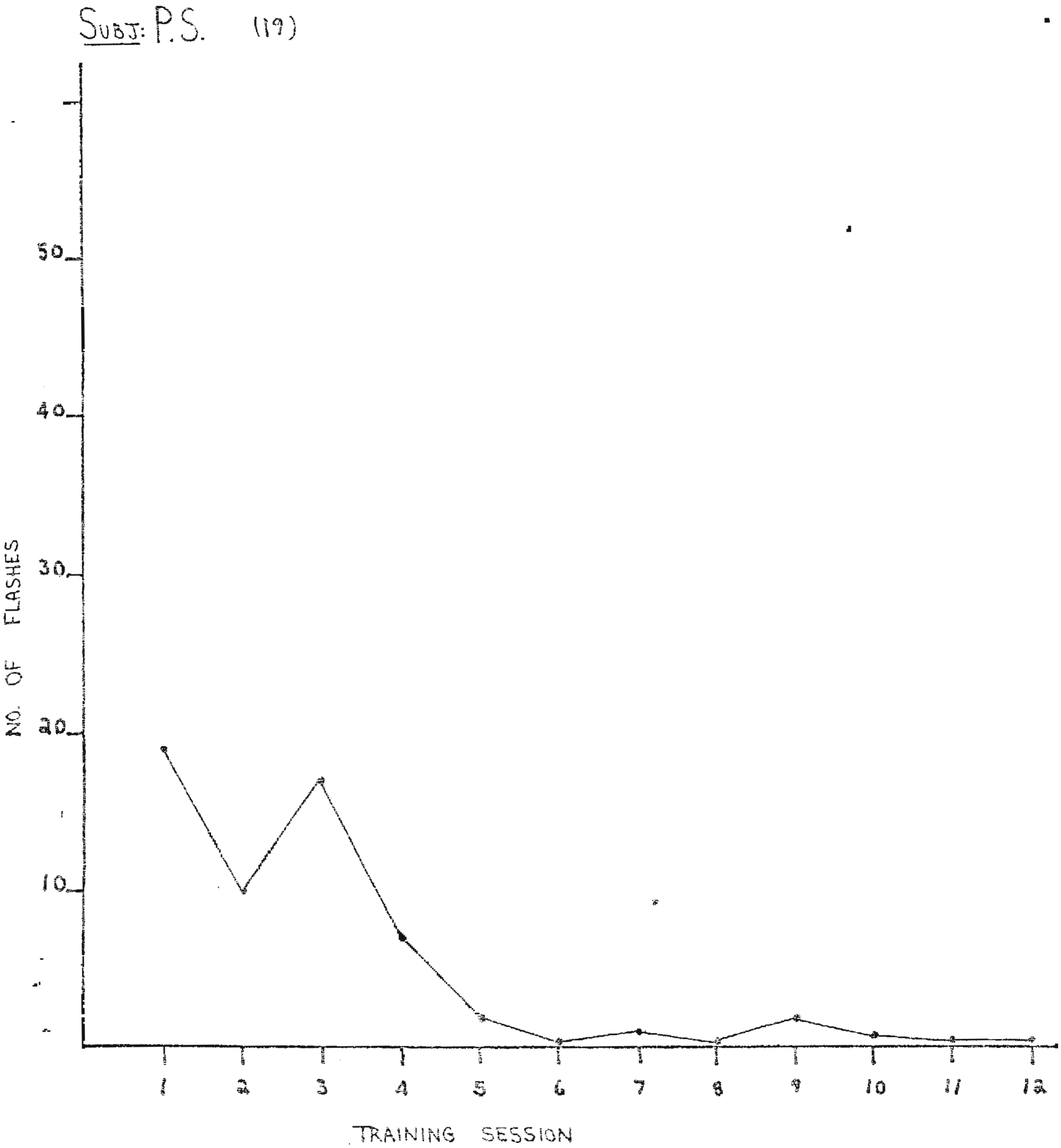


50
40
30
20
10
NO. OF FLASHES
CESSATION OF TRAINING, MET CRITERIA
1
2
3
4
5
6
7
8
9
10
11
12
TRAINING SESSION

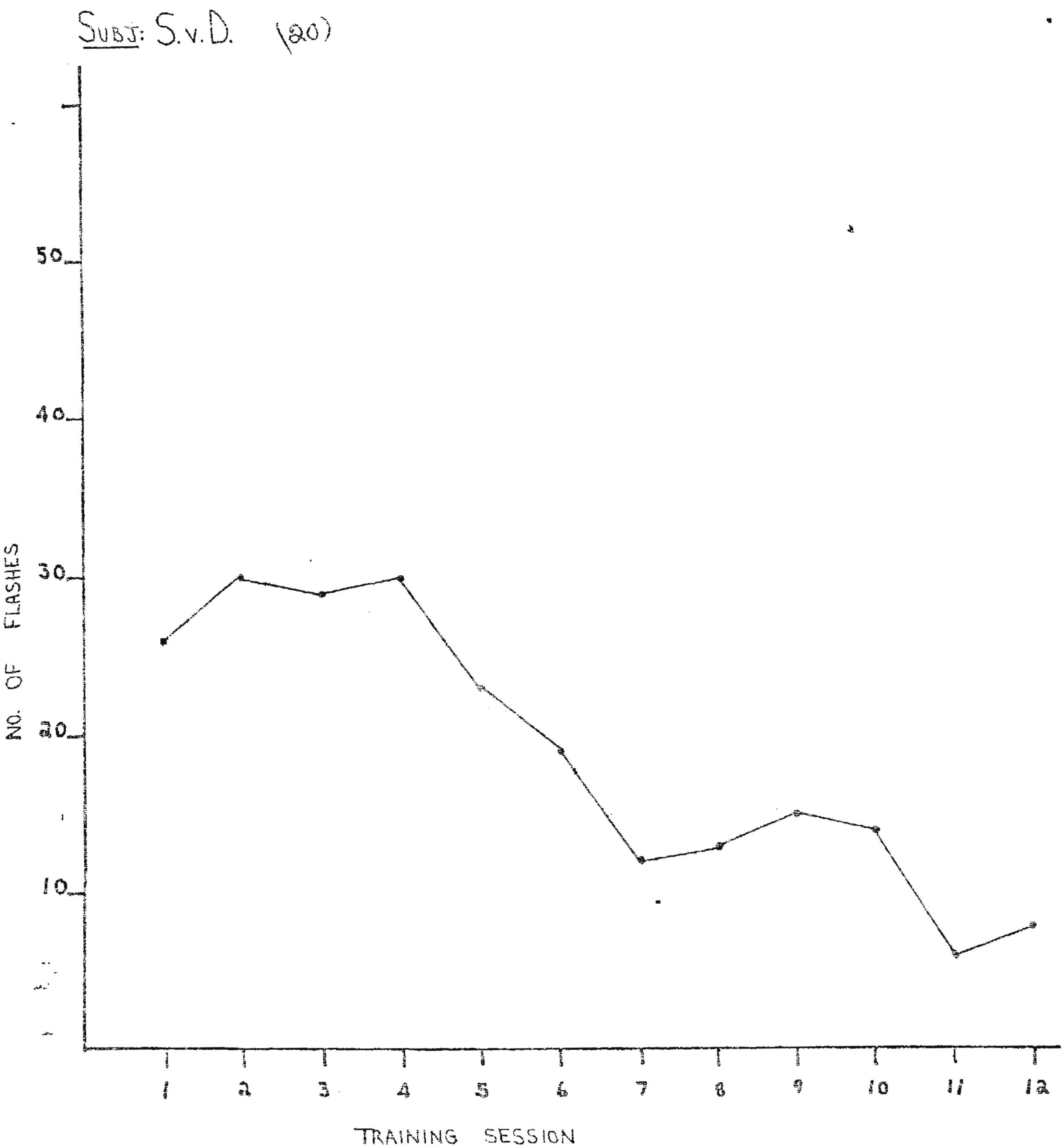
SUBJ: J. Mo. (18)



50
40
30
20
10
NO. OF FLASHES
FRACTURED TARSALS, MISSED 3 TRAINING SESSIONS
1
2
3
4
5
6
7
8
9
10
11
12
TRAINING SESSION



SUBJ: P.S. (19)
50
40
30
20
10
NO. OF FLASHES
1
2
3
4
5
6
7
8
9
10
11
12
TRAINING SESSION


Subj: S.v.D. (20)
NO. OF FLASHES
50
40
30
20
10
1
2
3
4
5
6
7
8
9
10
11
12
TRAINING SESSION

APPENDIX F

Subject	V.A. 4·25 m 4.0 cm	4·25 m 'Phoria	4·25 m B.O. Duction	4·25 m B.I. Duction	40 cm 'Phoria	40 cm B.O. Duction	40 cm B.I. Duction	\# 14B/ \# 15B	\# 20 / \# 21
1	20/20	6^Δ eso	16/48/20	6/2	4^Δ eso	12/22/28/20	14/x/22/18	+1·00 $\phi \rightarrow$ 8 eso	-2·25/+2·75
2	20/20	10^Δ eso	28/46/40	4/0	18^Δ eso	10/14/30/22	4/x/16/10	+1·75 4 eso	-0·50/+3·50
3	20/20	ϕ	16/30/10	8/3	9^Δ exo	12/x/32/20	10/x/20/8	Plano 8 exo	-2·50/+2·75
4	20/20	ϕ	18/46/20	8/4	8^Δ exo	18/x/26/16	18/x/20/14	+1·25 12 exo	-4·75/+3·00
5	20/20	4^Δ exo	4/10/6	10/4	10^Δ exo	x/x/12/8	18/20/28/20	+0·50 12 exo	-3·75 +2·25
6	20/20	ϕ	18/30/18	6/4	8^Δ eso	18/26/44/24	x/x/6/4	+1·25 2 eso	-1·00/+3·50
7	20/20	2^Δ exo	24/44/40	10/6	4^Δ exo	20/32/36/30	16/20/26/20	+0·50 2 exo	-3·25/+3·00
8	20/20	6^Δ eso	12/34/16	6/-2	12^Δ eso	8/20/22/20	6/12/18/2	+0·50 10 eso	-2·00/+1·50
9	20/20	2^Δ exo	14/22/9	9/4	12^Δ exo	9/x/20/5	9/22/26/18	+0·25 10 exo	-5·50/+1·75
10	20/20	ϕ	16/34/20	10/6	6^Δ exo	16/20/26/20	12/18/28/24	+1·00 7 exo	-3·00/+2·25

Subject	Visual Acuity 4.25m and 40cm	4.25m Phoria	4.25m B.O. Duction	4.25m B.I. Duction	40cm Phoria	40cm B.O. Duction	40cm B.I. Duction	#14B/#15B	#20/#21
11	20/20	4^{Δ} exo	8/20/10	10/6	10^{Δ} exo	12/16/24/16	14/12/24/18	Plano 6exo	-6.00/+3.00
12	20/20	ϕ	12/22/20	9/6	ϕ	26/28/28/26	8/x/12/8	+1.00 ϕ	-2.75/+3.00
13	20/20	ϕ	24/38/24	10/6	ϕ	x/x/24/18	18/x/22/14	+0.75 8exo	-1.75/+1.75
14	20/20	3 exo	6/38/12	12/8	4 exo	20/28/32/18	x/x/24/14	+0.25 8exo	-6.50/+2.75
15	20/20	2 exo	14/40/32	10/7	10exo ⊖ 5eso	x/x/28/20	16/22/28/18	+0.75 6exo	-4.75/+2.25
16	20/20	2 exo	24/40/32	10/7	4 exo	24/36/x/26	10/22/22/4	+1.00 4exo	-6.75/+3.50
17	20/20	4 exo	22/32/20	8/4	5 exo	16/x/24/14	16/x/20/12	+0.25 6exo	-4.25/+2.00
18	20/20	4 eso	20/56/50	10/6	7 eso	26/x/48/36	12/x/24/12	+0.25 4eso	-3.00/+2.75
19	20/20	4 exo	20/40/12	12/5	9 exo	12/24/30/16	12/18/26/14	+0.25 6exo	-4.00/+3.00
20	20/20	ϕ	28/46/36	8/4	7 exo	x/x/40/30	x/x/24/18	+1.00 10exo	-5.00/+2.75